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GAS JOURNAL

LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

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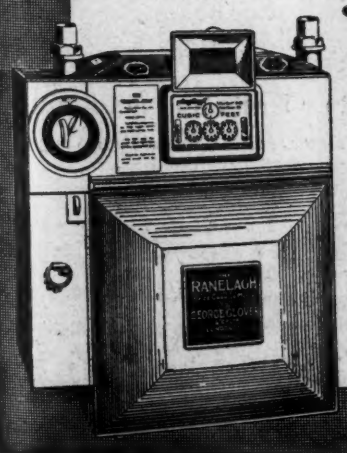

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EDITORIAL NOTES.

A Gigantic Amalgamation.

THERE have been rumours, and there has been an amount of liveliness in the Stock Market in consequence, of an approaching amalgamation of the Brentford Gas Company with the Gas Light and Coke Company. We have now authority for saying that the rumours actually foreshadowed an event regarding which a provisional agreement has been effected between the governing bodies of the two concerns. It is an old idea that some day this fusion would be brought about; and in these times, when the policy of consolidation has such large support from the legislative powers, there is little doubt that the anticipation will now materialize.

The scheme has been thoroughly examined by both Boards from all points of view; and the unanimous conclusion is that the welding together of the two large concerns will be beneficial to both. It will give the Gas Light and Coke Company a fine territory for development and expansion; and their resources and transport conveniences will bring upon the gas supply of the Brentford area substantial economies—gradually, of course, as combined working develops and becomes established. Transport has always been a difficult problem for the Brentford Company; their distance up the river making ungratifying comparison with neighbours in respect of cost of materials. But despite this fact, the Brentford Company, with progressive Board and Engineer, have done remarkably well for the consumers, and have advanced abundantly. There is promise that the rate of that development will be accelerated with the uniting of forces.

This amalgamation will be the largest in the history of the British gas industry. The Gas Light and Coke Company already lead in respect of magnitude in the world's gas supply. The Company in 1923 sold 167,059,775 therms; and the Brentford Company, 23,069,127 therms. This year the Richmond and the Harrow and Stanmore Gas Companies have been incorporated in the Brentford Company. The Richmond undertaking last year sold 1,614,821 therms; and the Harrow and Stanmore, 2,597,301 therms. These figures make a total of 194,341,024 therms. The coal used by the Gas Light and Coke Company in 1923 amounted to 2,055,117 tons; by the Brentford Company, 270,940 tons; by the Richmond Company, 22,410 tons; and by the Harrow and Stanmore Company, 25,030 tons—together 2,373,497 tons. The quantity of oil used for carburetting by the Gas Light and Coke Company last year was 10,689,431 gallons; by Brentford, 2,232,978 gallons; by Richmond, 113,318 gallons; and by Harrow and Stanmore, 303,997 gallons—a total of 13,339,704 gallons. This will indeed be a gigantic amalgamation.

Complete Maintenance in Consumers' Houses.

WE believe that a large proportion of the gas suppliers in the country will of their own volition undertake the maintenance of consumers' gas appliances, and those who do not immediately will ultimately be driven to it by competition. Some of the concerns which have adopted a liberal policy in this respect find that their only regret in the matter is that they did not do so before, for the earlier adoption of the far-seeing policy would, they are now convinced, have saved some of the business which has been taken from them. Experience has convinced them that, in not inconsiderable measure, the fault was theirs through not having an intimate acquaintance with conditions existing the other side of the consumers' doors. There may be a disposition on the part of some gas suppliers to blame consumers for this; but it must be remembered that, generally speaking, the consumers are not wedded by personal interest to any one means for obtaining light, heat, and power. What they want is the form that gives them the greatest measure of efficiency for the least expenditure. It is the gas suppliers who wish to do business with those who have use for their prime commodity; and not the latter who are particularly desirous of having transactions with the gas suppliers. We have been privately asked why gas suppliers should do more for the consumers than the retail oil merchant or the coal merchant? The simplicity of the question is somewhat amazing with a monopoly in the supply of only one commodity. That commodity is subject to competition from other agents—in other words, the monopoly merely exists in the individuality of the commodity supplied. The means of its use are altogether different from the crude, labour-promoting methods of coal and oil. But gas—despite its labour-saving and good lighting, heating, and power qualities—can only give of its best by attention to regulation, cleanliness, and repair. Its intrinsic virtues are more or less lost by any neglect which denies to them full play. Most consumers are given to neglect of their gas-using appliances. Therefore, there is only one thing to be done, and that is to legislate to counter that neglect, and so preserve business. This means maintenance—not partial, not make-believe, not half-hearted, but full maintenance.

Through the North British Association of Gas Managers, attention was some time ago directed by Mr. Edison Stones to an experimental investigation in one ward of Glasgow to ascertain the conditions of consumers' appliances, and to get experience of the work and cost of maintenance. What was then found surprised the Gas Department; what was found exists no longer, for in the place of makeshifts, defective appliances, and dissatisfaction, good performance and contentment now prevail. The experience gained has enlarged the views of the Gas Department; and a very complete meaning is to-day given to the expression "maintenance." If one asked the staff of the Glasgow Gas Department what they meant by the word, they would refer to a phrase used by their Chief Engineer and General Manager (Mr. J. W. M'Lusky) in his Presidential Address to the North British Gas Managers' Association, as published last week. "The Glasgow interpretation of the term," he said, "is a "house-to-house maintenance of all gas-consuming appli-"ances without any qualification regarding their ownership." That is about as thorough as it can be—"house-to-house" maintenance, and "all" gas-consuming appliances, without regard to ownership—whether privately owned or hired from the department. The sole reason for this thoroughness is that it was found in the consumers' houses that efficiency was the exception and not the rule. Where that is the case, then there can be no real security for the business, because whatever the inefficiency in use the narrower must be the margin of economy between gas and a competitor; the greater the inefficiency, the less becomes the margin. The point at which the maintenance scheme started in Glasgow was by taking a census of the Carlton Municipal Ward, with its 10,449 houses and other premises. Such a census, as Mr. M'Lusky points out, shows two things—the broad basis on which the gas business rests, and the weak spots in it. In that district, there were found 37,041 gas-consuming appliances, 26,778 of which were lighting burners, and 10,263 appliances of 44 different types (a list of which will be found in the address of the President). Knowledge of this kind supplies the gas salesman with information as to

where, and the directions in which, he should operate to secure an extension of business. Though the experience has been short in Glasgow—this point should be marked—the maintenance fitters have obtained more orders for appliances than have been received from any other single source. One of the weak spots in the list given in the address is that with 8213 houses out of the 10,449 premises, only 734 cookers are in use and 1045 gas-fires. These together represent only about 17½ p.ct. of the 10,263 appliances in use other than lighting burners; so that there is in the one ward a big field for development. However, both appliances and service-pipes were found to be in much need of attention; and the energy that was applied to remedy this state of things has resulted in such satisfaction among the consumers that the Gas Committee and the City Council accepted the advice to extend the scheme to the whole district of supply. What Glasgow can do, other places can do—and Glasgow is not the only example of a far-reaching maintenance policy.

The Glasgow testimony, however, is highly important. It is the gaining of the satisfaction of the consumers that is the best possible assurance to the gas business; and what is more, the consumers do not mind providing the cost of enjoying the satisfaction. It is a question whether it actually costs them anything, seeing that higher efficiency must result in more economical consumption of gas. The saving thus secured must more than compensate them for the maintenance cost per therm. It will be remembered that months ago it was estimated that the cost in Glasgow of this maintenance scheme would work out to 1½d. per 1000 c.ft., or 0·31d. per therm. Since then there has been a large experience, and accurate figures have been kept, with the result that—though at the initial stages, when the rough work has all to be done—the actual cost has been less than the estimated figure. Now there are twenty-six districts in the city and seven outside (with respectively 198,895 and 14,552 premises) under continual maintenance; and the number of appliances dealt with under the scheme, by a staff of 136, during the year ending May 31, was 410,789. The cost of labour, supervision, rents, material, and oncost was £10,478 14s. 8d., which worked out to 6·12d. per appliance. Mr. M'Lusky, his staff, Committee, and the City Council are all to be congratulated on this effective piece of enterprise. A "public utility undertaking" should be so in fact as well as in name. The President promises to supply on some future occasion further details as to the methods of organization as well as additional analytical figures when the scheme is fully in operation. The industry will be pleased to have more data when available; but meantime the information from Glasgow will be an influence for much good in the industry.

Gas Directors who are Councillors.

GAS directors who are councillors and whose companies have contracts with the local governing body are in a quandary as to how they should act in view of the judgment of the late Mr. Justice Bailhache in the Leeds case. We see that at Chertsey Mr. George Wells has resigned from the Council of which he has been Chairman, and Mr. F. Bartholomew has severed his connection with the Board of Guardians, on which he has served fourteen years, and of which he has been Vice-Chairman. Both are Directors of the Chertsey Gas Company, who have contracts with the Council and the Guardians. The judgment has caused a pretty medley, and threatens to deprive local governing bodies of some of their most distinguished and valuable members. The position is one upon which it is difficult to give advice which it would be proper and safe to follow. But for what it is worth, our own view is that, as it has been publicly announced there is to be an appeal in the Braithwaite case, one in the position of a Gas Director should await the result in the Appeal Court before resigning from a public body with a contract running with the local gas company; but should, meantime, proposed new contracts with the company be under consideration, he should take no part in their discussion, nor should he vote upon them. As to existing contracts, resignation now will not affect the fact that there was membership at the time the contracts were entered into. If there is any revision of the law relating to this subject, a point should be made of the inequity which exists since municipal authorities have entered so largely into municipal trading in electricity. When it is a question of public lighting, gas directors sitting on a council are debarred from voting on the gas contract, while every member of the electricity committee is allowed to vote against a contract being entered into with the gas company and in favour of one with the electricity department. In that case, it may be, the best interests of the ratepayers are not protected. It is an abuse of what in law is known as "equity."

Responsibility of Officials.

IT IS not of frequent occurrence that a charge of dereliction of duty is made against a gas official. There is, with very few exceptions, a high standard of honour existing in all grades of the official staffs of gas undertakings, and a full sense of acceptance of the responsibility which their positions involve. There have, however, been exceptions to the general rule; and there may be exceptions now. Should there be any who come within that category, it is as well to put before them an illustration of what may befall by neglect of responsibility. A suitable one is found in the report of Mr. A. A. Hudson, K.C., and Mr. Henry P. Vining, Commissioners under the Boiler Explosions Act, on the explosion of a boiler on the turbine steamship "*Engadine*." The explosion occurred on April 11; and four men received fatal injuries. The cause of the explosion was shortness of water in the boiler; and thereby the tubes became overheated. The Third Engineer, named Warman, was the responsible officer in charge; and his evidence was so unreliable, so easily picked to pieces, and so contrary to the other evidence, that he came through his examination by the Commissioners with anything but a clean sheet. In the event, the Commissioners placed all the blame upon him. The Chief Engineer and the Second Engineer are freed from all responsibility for the explosion. But the Commissioners found that the Chief Engineer was very inefficiently served by the junior engineers. As a matter of fact, before the explosion, he had noticed that the water in the feed float tank was increasing; and he at once came to a conclusion as to the cause, and gave directions accordingly. Junior officials are appointed to relieve the chiefs from details—particularly the minor ones; but there is not much relief if no reliance can be placed upon them to perform or to supervise the most simple functions. Duty should always come first; and where duty is concerned, no avoidable neglect should be allowed to have place. Competent officers are appointed to fill positions of trust; and when through their neglect accidents happen, their employers cannot morally have blame attached to them. If any blame could be ascribed to them, it would be on the ground that they were not sufficiently capable of selecting dependable officers; but if misled or there is misjudgment through the character of the evidence before them, there can be no valid imputation against them. In making selection, however, ethical considerations should accompany those dealing with competence, as even the most technically competent men may fail in their duty. In this case, Warman was ordered to pay £10 towards the costs of the formal investigation; but the Commissioners are careful to state that this must not be taken as any measure of the blame they attach to him. Neglect caused the loss of four lives!

"The Workers' Charter."

THAT IS what it is called by the Trades Union Congress. But we are all workers, though many of us are without association with a trade union, and so have not adopted the charter, and strongly object to anybody else assuming the right to act on our behalf. The so-called charter is composed of a number of resolutions which have been passed year after year at the Trades Union Congress, and have never materialized. The number of years the resolutions have been brought down from the trade union shelves, dusted, and formally re-adopted, and then again put back into storage, indicates that they merely express the aspirations of a minority of the country, and not of the majority. Were they the resolutions of the majority of the electors, they would have been on the Statute Book long since. But they are not, and are not likely to be, although the Trades Union Congress Council have authorization to prosecute an intensified propaganda throughout the country to educate the people, and to make the unbelieving turn from the errors of their ways. Apparently the delegates to the Congress are a bit tired of the formality of passing the resolutions one by one year by year. Hence their fusion into a "Workers' Charter," which was unanimously adopted,

after a little desultory discussion. Really there was nothing to be discussed; for each constituent resolution has been worn bare by the torrent of past rhetoric.

One of the old composite items of policy is the public ownership and control of the natural resources and services of the country—nationalization of land, mines, and minerals—the extension of State and municipal enterprise for the provision of social necessities and services, and the making of proper arrangements for the adequate participation of the workers in control and management. The Miners' Federation, we suspect, are not satisfied with having their pet scheme of mine nationalization rolled-up in the "charter." They prefer a little more limelight on their particular share in it; and possibly it was the strength of the miners among the labour organizations that obtained for them permission to have, after the passing of the charter, a resolution of their own on the subject. The Communist Secretary of the Federation (Mr. A. J. Cook) proposed the resolution, which reaffirmed the principle that nothing short of nationalization of the mines and minerals of the country would be a satisfactory solution of the mining problem, and requested the General Council to take every means possible to further the principle, and to have it placed on the Statute Book. The first part of the resolution is an antiquated opinion of a section only of the community, and does not accord with the views of a much larger section. When (if ever) the position is reversed, it will have a better chance of acceptance by Parliament. There is no information as to why it is considered that nationalization would be the only "satisfactory" solution of the mining problem; it is more likely that it would not be a "solution" at all, but would place upon the chief asset of the country conditions which to the vast majority of the people would be most unsatisfactory. It is true that some of the miners are working only two or three days a week (which is more than a million and a quarter of people are doing in certain other industries), and so, in company with the other parts of the industry, they are passing through a grave crisis. But nationalization is not the corrective for this condition of things. The causes are many and deep; and change of ownership would not of itself remedy them. Men who think otherwise cannot be blessed with much intelligence. The Miners' Federation profess that nationalization would put an end to the waste and inefficiency which, they assert, now obtain under private ownership. The Council of the Federation should dissect the costs of winning coal per ton, then deduct the wages paid per ton, and show how savings are to be effected between the wage cost and the pithead price of coal. That would be a bit of constructive work which we should all welcome. It seems to us that one cause of waste and inefficiency may be found in the employment of 1¼ million people (or thereabouts), working seven hours a day, and producing less coal on an average per worker than any other country in the world. But this is a condition over which such men as Mr. Cook simply shrug their shoulders; and they will not, or cannot, muster up courage to go beyond that (to them) blessed word "nationalization." In other countries, nationalization has had no good effect; and there is no chance of its being more successful here. There was a pertinent question asked during the discussion at the Congress. The General Council were requested to explain how the Congress could support the claim for the nationalization of the railways without first repudiating the Dawes Report, which calls for the denationalization of the railways in Germany. The Chairman of the Congress preferred to shunt the question to one side by declaring it out of order. He remarked that the Dawes Report refers to Germany, and not to the nationalization of British railways. Nationalization is a question of principle; and in such a matter as this no distinction can be made merely by a difference in geographical situation.

Another item in the charter concerns wages and hours of labour. A legal maximum working week of forty-four hours, and a minimum legal wage for each industry or occupation are desired. In the first place, there can be no interference with work by a universal fixing of hours without affecting the economic circumstances of an industry, as is proved by the miners' seven-hour day. The miners are very solicitous that reparations coal shall not injure the economic conditions of the mining industry; they are less anxious regarding the effect upon those same economic conditions of their shortened day. Then what is a minimum wage? What are the factors that should decide it? Poplar might determine that road sweepers should have a minimum wage of £4 a week. But in many industries in which craftsmen are employed, the only factor that could be applied would be the wage an industry was capable of paying in order to enable it to live and compete with the similar industry of other countries. Directly an industry cannot compete in price, its stability is undermined, and unemployment vigorously sets in. Thus the factor would have to be quantitatively changed with every alteration in economic conditions; consequently it would be impossible to standardize a minimum wage for all times and employments. There are considerations and issues applying to this question which even the Trades Union Congress cannot settle, though, after their own fashion and in the air, they determine most things to their satisfaction, much to the amusement of men with greater competence in these affairs.

Among other items in the "charter" are suitable provision in relation to unemployment, with adequate maintenance of the unemployed; establishment of training centres for unemployed juveniles; and extension of training facilities for adults during periods of industrial depression. Proper and adequate housing accommodation is also required. Full educational facilities are to be provided by the State—from the elementary schools to the universities. Sought, too, are adequate maintenance and compensation in respect of all forms of industrial accidents and diseases. State pensions are desired for all at the age of sixty, as well as pensions for widowed mothers and dependent children. There is no indication as to the contribution the trade unions are prepared to make towards these objects. But it seems they have an idea that the State can find the money for everything they ask for, despite the financial circumstances of the country to-day, and an income-tax of 4s. 6d. in the pound, the continuance of which is depriving the country of much of the capital which is as necessary as labour to the promotion of industry, trade, and employment. It is hardly worth while, during the existence of present conditions, devoting space to comment upon the major part of these last-mentioned proposals. What has been written, however, gives an indication as to the constitution of the "charter," which will probably be brought forward time and again as the individual resolutions have been in the past, and, so far as we can penetrate the future, with the same measure of success—at any rate, it is safe to say for some time ahead.

Parliament.

It is announced that Parliament will meet again on the 30th inst., owing to Sir James Craig still refusing to nominate a representative on the Irish Boundary Commission. It is not anticipated that the session will last more than ten days.

End of Summer Time.

The Home Secretary has given notice that Summer Time will cease and normal time will be restored at 3 a.m. (Summer Time) on the morning of Sunday next, Sept. 21, when the clock will be put back to 2 a.m.

Wembley Visitors.

Last week was one of the best Wembley has had for attendance. On Saturday the attendance was over a quarter of a million—to be exact 254,592; making for the week a total of 925,228. Up to Saturday, the number of visitors since the exhibition opened was 13,847,061. It is now stated that the prospect of continuing the exhibition next year is brightening; some of the Dominions being now inclined to reconsider their decision not to incur further expenditure at present.

Mr. Butterfield's Report.

The National Gas Council have appointed a Committee to consider the recommendations in the report made by Mr. W. J. A. Butterfield with regard to carbon monoxide in public gas supplies. It will be remembered that the Council undertook to submit to the Board of Trade suggestions for the provision, so far as practicable, of inspection (where not already made by gas undertakings) of the gas piping, fittings, and appliances in dwelling-houses. They also promised to invite the makers of gas fittings and appliances in this country to confer with the Council, with a view to submitting to the Board effective proposals, if such can be devised, for discouraging (and if possible, preventing) the sale of undesirable types and qualities of fittings and appliances, and the fixing of geysers and similar appliances without adequate and trustworthy means of ventilation.

Agricultural Research.

Makers of sulphate of ammonia will be interested in the announcement of the Ministry of Agriculture that the Government have decided to provide a further sum of £500,000 for agricultural education and research, additional to the funds already available for that general object amounting to £1,000,000 under the Corn Production Acts (Repeal) Act, 1921, and about £400,000 per annum from other Government funds. It has been arranged that this new money will be paid over to the development fund by the Treasury as required, and that it may be looked upon as provided for use during the next five years. No definite allocation as between Scotland on the one side and England and Wales on the other, has been made.

Ancient and Modern Regulation.

The Metropolitan Water Board appear to be inclined to adhere to ancient regulations which are out of harmony with modern conditions. They have a regulation, born in the year 1872—52 years ago—which ruled that every "boiler" must be supplied with water through a cistern, and not be directly connected with the water-mains. They applied this to geysers; but objections on the part of the National Gas Council caused the Board to relax to the extent of giving permission for geysers to continue to be connected as has hitherto been the practice, provided there is a break in the water supply between the tap and the body of the geyser. Even as a temporary provision, the Council consider this arrangement unsatisfactory. They have therefore decided that, if the Board cannot agree to renounce the regulation in the case of all geysers, every possible step will have to be taken to secure the amendment of the antiquated regulations, which were drafted at a time when geysers were practically unknown, and are opposed to the needs of the present day. The Board should show they are capable of moving with the times; and perhaps as the result of a further report which is being prepared by one of their Committees, they will give evidence that they have the capacity for doing so in this particular.

Home Industries and the M'Kenna Duties.

The M'Kenna duties were first imposed on Sept. 29, 1915. They consisted of a tax of 33⅓ p.ct. *ad valorem* on certain imported articles. In his recent Budget, Mr. Snowden insisted upon the abolition of the duties. The industries concerned protested, and so did the workers in them—the latter seeing no reason why there should be interference with the economic stability of the industries which gave them employment, which employment would be jeopardized by what was proposed. Mr. Snowden tried to soothe their fears; but we are afraid the workers gauged better than he what would be the actual effects of the removal of the duties. Experience is justifying the representations they made; and the more experience confirms their fears and views, the greater will be their enmity towards those who brought upon them these conditions. The duties were cancelled as from Aug. 1; and the trade returns for the month disclose some bitter and hard facts. In every direction where the M'Kenna duties gave partial protection, the month shows a large increase in imports, both in number and value. So much the worse for employment in this country. Our Socialist-Labour Government appear to be more capable of giving employment to workers abroad than to our workers at home.

World's Oil Supplies.

Recently Prof. Chrysler, of New York, predicted that at the present rate of consumption the world's oil deposits would be exhausted in thirteen years. Previous computations have suggested a longer period than this; but still the best of calculations have only conferred upon the American deposits a lifetime which would now mean about double the life accorded by Prof. Chrysler. A few years ago, the estimate was thirty years for the American deposits; but that was based upon the rate of increase of consumption as then known. Since then there has been a big impetus to the use of oil and spirit; and one often wonders how long it will be before America as an oil-exporting country will legislate to prevent shipments from that country to help to satisfy the rest of the world. The "Petroleum Times" is inclined to ridicule Prof. Chrysler. It admits that the question is obviously of vital interest to all engaged in the petroleum industry; but it doubts if there are many who will be inclined to agree with the learned Professor. Our contemporary disagrees with him *in toto*. It says that "enormous though the quantities of crude oil have been which the earth has yielded thus far, we are satisfied in our own mind that even larger quantities remain to be discovered. Indeed, at the present moment we see fields coming into development which, in all probability, will furnish supplies more prolific than even Baku or Mexico. It would have been interesting had Prof. Chrysler told us how he arrived at his conclusions." Just so; it would also be interesting if our esteemed contemporary had told us how it arrived at its conclusions, particularly in view of what has happened in California and Mexico. We are not prepared to take one side or the other in this matter; the extent to which we are prepared to go is to say that the future of the industry depending upon oil deposits is extremely speculative, having regard to the daily increasing demand and the falling production of some noted oil-fields.

Gas in Making Surgical Webbing.

Recently the engineering staff of the Boston Consolidated Gas Company introduced into the works of the Everlastick Company the use of gas in the making of webbing for surgical bandages, and similar purposes. Steam plays a large part in the shrinking and sizing of fabrics; and the arrangement has been to have steam under pressure circulating through a system of pipes with small openings to allow the steam to escape. The fabric came in contact with these tiny streams of steam as it was drawn across the pipes. However, the metal hoods over these pipes failed to collect all the steam, and a great deal escaped into the room, rendering working conditions far from good. Besides this, fluctuations in steam pressure interfered with production, and was the cause of many complaints. To remedy this unsatisfactory and wasteful condition of affairs, explains the "Gas Age-Record," a metal container 30 in. long, 10½ in. deep, and 12 in. wide was made. This box, half full of water, was set-up with a bunsen burner under it which boils the water, producing a constant supply of steam in the upper portion of the container. The webbing, passing through a slot in the top of the box, receives the required steam treatment under much better conditions. Five other machines using this method are now under construction. This experience with the industrial use of gas has led the Everlastick Company to consider the conversion to gas-firing of heating rolls in another department.

Gas in the Textile Industry.

In the textile industry, one of the troubles experienced by finishers is in the heating of the calenders, which give to the fabric the firmness of touch required, and enhance the lustre of the yarns. Many calenders are at present heated by steam, but certain disadvantages attend this method. One of the principal objections is the irregularity of the heat thus furnished, and the consequent lack of uniform results in the finished fabric. At the best, steam as used in most finishing departments is an unreliable agent, and its capacity as a heating medium is very limited. The question of economy is also of great importance. Thus many finishers have endeavoured to adopt other heating appliances, with more or less success. Illustrating, in the "Gas Age-Record," a gas installation in the factory of the Oriental Silk Printing Company, Haledon (N.J.), Mr. John T. Travis states that many types of burners have been developed for the purpose of heating calender rollers in this way, and, as the roller must of necessity be heated internally, some difficulty has been experienced in finding burners which could be depended upon to furnish uniform heat and ensure perfect combustion in the restricted area. To furnish air in proper proportion to the gas consumed, positive pressure blowers are used, and by this arrangement any desired temperature may be maintained. Suitable heat control apparatus is provided, so that the temperature of the roller is absolutely controlled, within 5° *plus* or *minus*, at any point necessary. The burners may be so arranged as to furnish heat only to the part of the roller to be brought into contact with the goods, and the ends of the roller are consequently comparatively cooler than the part where the heat is applied. The annoyance of leaky stuffing boxes is eliminated. Another decided advantage of gas is the great saving of the time required to heat the roller to a given temperature, as this can be done by gas in considerably less time than required for heating by steam. Any temperature desired may be maintained by gas heating, whereas with steam only comparatively low temperatures can be obtained. The idea has been expressed by some finishers that steam as a heating medium for calenders furnishes a "softer" heat than gas, at the same temperature. This is, however, says Mr. Travis, an erroneous impression, and is no doubt due to the fact that gas, being more efficient than steam, might through lack of attention on the part of the operator, heat the roller beyond the temperature required.

Obituary.—We regret to have to record the death, which occurred on Wednesday last, of Mr. William George Beaumont, senior partner of the firm of Messrs. W. G. Beaumont and Sons, of Priory Works, Bow, E. 3.

ELECTRICITY SUPPLY MEMORANDA.

THE combination of gas and electricity supplies in small towns is forging ahead. There are several examples in the country to-day. Crowborough and Swanage have helped to extend the list during the past twelve months; and Oakham has now to be added. The Oakham Gas Company, when they had their title extended rather more than twelve months ago by adding "and Electricity" after "Gas," and secured the necessary parliamentary powers, determined not to let the grass grow under their feet, but to carry out their obligations in the matter of electricity supply at the earliest possible moment. To-day from their one works, under one Board of Directors, under one supervision, they are supplying gas and electricity; consumers have only to make their choice, and the Company will do business with them in either commodity. The Chairman (Mr. S. W. Clark), his colleagues, and the Engineer and Manager are to be complimented on their venture and their expedition in providing a supply. They could not have done better than they did by placing the work of electrical equipment in the hands of Sir Charles Bright and Partners, and so securing the services of Mr. A. Hugh Seabrook, who is to-day an expert in the matter of interpolating electric generating plant into a gas-works system. Information was given last week in our news columns as to the inauguration of the plant. From what is read there, it is certain that the people of Oakham are to be congratulated in that they have a public utility undertaking in their midst enterprising enough to give a supply of electricity, thus saving them from having an independent concern, which, if owned by the District Council, might have meant financial losses for the ratepayers, or, owned by a company, could not have been run so economically as by the existing Gas Company, and the probability is that, competition notwithstanding, both gas and electricity would have had to be at higher prices than will eventually be the case under the one ownership. Moreover, it is rare that such small electricity concerns can be run independently on a paying basis. Of course, the Oakham Company will have to establish their new business, and settle down into it before the full benefit will be secured. But Oakham has joined the band of pioneers in this matter. The Company have spent between £6000 and £7000 on the electricity concern; and this attests their confidence in having done the right thing—in a town of the description of Oakham. Another point is that the generating plant is gas driven; and thus there will be no need for continuous attention. One set comprises a 75-H.P. gas-engine, driving an alternator of 50 KW. capacity, and a 26 H.P. engine driving a 10 KW. alternator. The smaller set will be used at times of minimum demand, or with the larger set when the demand happens to take an abnormal flight.

Another Combined Business.

While speaking of this matter, there is another point worth remarking upon. It is seen that for the generation of electricity, Oakham is making use of a product of coal, and not coal itself. The Consulting Electrical Engineer (Mr. Seabrook) is an enthusiast in fuel conservation. We know that his views are that—excepting the material is of a grade which is not suitable for carbonization and bye-product recovery—coal should not be used for electricity generation. We remember that many years ago, when in practice as an official electrical engineer, he became a convert to the utilization of coke in combination with coal for steam-raising; and thus did a part (when others were hesitating) in promoting the conservation of the latter fuel. The more he has been brought into contact with gas processes, the more convinced he has become as to the seriousness of the waste there is in using coal rich in bye-products for the raising of steam; and yet there are many electrical engineers who are daily doing this, and will continue to do it, despite the fervent utterances on the co-ordination of the utilization of fuel at the World Power Conference, and the prayers and warnings of fuel economists. We ought all to be fuel economists in these days; but many electrical engineers seem to be obsessed with the narrow view that fuel economy begins and ends with the lessening of the pounds of coal consumed per KW.-hour generated. The products of coal carbonization are equally as necessary to the well-being of the country as is electricity. On such products industries live, and those industries are patrons of electricity. This is an illustration of the interdependence of industries; and the electricity industry can no more do without the coal carbonization industries than the gas industry can do without markets for its several products.

True Coal Conservation.

This brings us to a point which has not been technically discussed, but which is a possibility. There is talk of big power stations and vast transmission lines. The big power stations have their limits of economy; and there must be a discount from any economy so effected by the cost of the main transmission lines intersecting the country, and conducting the electricity long distances. The capital cost and the upkeep of these will not be light. Then, if there is carbonization of coal at those power stations before generating electricity, there will be the question of dealing with and distributing the bye-products; and the greater the supply, the lower will become the price. A short time ago, Mr. Seabrook started a new idea in our minds. It was this, if main transmission lines are to be run throughout the country, why should they not be fed with current from every available source, and particularly from the carbonizing works of the gas industry, inasmuch as electricity produced by them would preserve the bye-products of the coal. The gas-works would only use the quantity of coal required for gas production; and the bye-products market would not suffer from a superabundance of output. Another thing that would happen would be that there would be less loss in transmission owing to the shorter distances the current would have to travel from the seats of generation. Moreover, the secondary products obtained at large centralized power stations would suffer from the fact that they would have to compete with the locally made products of the gas-works, which could be sold at a cheaper rate, owing to the fact that there would not be such long-distance conveyance to be paid for. The question of gas-works stepping-in as the feeders of an electricity transmission system is highly interesting. But it is not a matter that can be determined off-hand; it would require very careful technical and commercial investigation before adoption as a settled policy. It is a proposal that would unquestionably, if feasible, tend to coal conservation in the fullest sense of the word. It must, however, be left at that, for those who are interested to penetrate the idea further, and give us the benefit of their views.

Gas-Works as Feeders of Main Transmission Lines.

The excitement over the new wiring and equipment rules of the Institution of Electrical Engineers shows no signs of abatement. The extensive revision there has been does not seem to have taken account of the vast change there would have to be in appliances and other items in equipment in order to comply with the regulations. No one asks whether the interest of the electricity industry would be better served if the new ordinances were rigorously complied with. The chief concern is as to whether they can be evaded; and when this point is raised, the question is asked, Who can enforce them? Then there is the comforting reflection that no one has the power to enforce, unless the Fire Offices refuse to insure all premises in which there is nonconformity. All this suggests that, if the revised rules be right, then there must have been a considerable amount that was wrong with the appliances that have hitherto been on the market, and many of which have caused much uneasiness to their users. "Megohm" of the "Electrical Times" says, "when the makers of fittings and accessories begin to realize all the changes in design that will become necessary, they will be crying out for the blood of the five gentlemen who represented the 'B.E.A.M.A.' on the Committee." There is little use doing that. If people want appliances that conform with the new rules, then they will have to be produced. If they are not, then the makers will lose business. If they have to provide standard appliances, then the cost must be increased, and that will not suit the notions of either the manufacturers or the contractors. Should electricity consumers get hold of the idea that there are greater safety and working efficiencies in appliances made to conform with the new rules, then they will ask to be assured that what they purchase complies with them in every detail.

Wiring Rules and Appliance Design.

From a letter contributed to the "Electrical Times" by Mr. A. H. Dykes, who is a Consulting Electrical Engineer, it would seem that far from the Fire Offices, who subscribe to the new rules, insisting on their observance, they are likely to ignore them. The letter by Mr. Dykes is so interesting in this connection that we take some copious extracts from it. In the first place, he asks: What was the object in issuing the rules? Were they intended to form a standard for good work so that everyone could feel sure that, if their installation complied with the rules, they had in every case a perfectly safe and reliable installation, or do they represent the minimum requirements for safety? Unfortunately, remarks Mr. Dykes, they can scarcely claim to be the former, as under the new rules there is nothing whatever to prevent a contractor running lead-covered wires out of sight between floors and behind panelling or in damp plaster, both of which practices were prohibited under the old rules as dangerous in certain cases. On the other hand, the regulations call for many precautions which, while very desirable in the case of important installations where every possible precaution has to be taken to ensure permanence and freedom from any possible risk of fire or accident, could in a large number of cases be omitted without any serious danger or trouble. Then we come to the part of the letter which deals with the Fire Offices. Mr. Dykes says it is stated in the rules that they have been adopted by practically all the fire insurance companies. In a recent case his firm had to inspect an installation in a somewhat important building; and their report showed that the wiring did not comply with the wiring rules or indeed with the old rules. The contractors stated that they had carried out a large number of installations in the same way, and no question had been raised by the insurance companies or any one else. In the absence of a specification, was one (asks Mr. Dykes) justified in condemning the installation knowing that there were numerous similar ones giving no trouble? On referring to the insurance company responsible for the risk, they confirmed that they were quite prepared to accept it (as a matter of fact their representative had never seen the new wiring

The Fire Offices and the Rules.

rules) since, as they explained, the risk was very small; and if they did not accept it, the next fire insurance company would. We agree, it is no use the representatives of the fire insurance companies on the Wiring Rules Committee asking for rules if the companies themselves are prepared to ignore them. If the risk of fire is so slight, why call for elaborate rules in the case of electricity and not where other systems of lighting are employed?

The Crux of the Letter.

This brings Mr. Dykes to the crux of his letter—viz., that the new rules set up a standard which, it appears, is not likely to be worked to except where a client or his engineer specifies that the work is to be to the new rules, and sees that he gets it, and that there is no standard below that setting forth the minimum requirements necessary for safety from fire and shock. The fact that the insurance company say that what is admittedly a poor installation is good enough for them, that the risk is very small, and they are prepared to take it, shows that for a great deal of work the standard of the rules is too high, and to insist on them will increase unnecessarily the cost of the wiring work in smaller houses, and so retard the general adoption of electricity. At the same time the contractors are put in an unfair position. Either they are going to comply with the wiring rules, in which cases their prices will be higher, or they are going to neglect many of the requirements and lay themselves open to be pulled up at any time and accused of doing poor work which will not even comply with the wiring rules. It is obvious that soon the question will arise as to the standard of work which will be required for registered electrical contractors. Is every installation they carry out expected to comply in every respect with the new rules? If not—what is the standard by which they are to be judged? Setting up a standard which is only complied with in exceptional cases is, Mr. Dykes fears, likely to do more harm than good. He considers that the new rules may be accepted as the standard recommended for the best quality work where price is not a ruling factor, but that in addition there should be another set giving the minimum requirements for safety, which requirements should be definitely insisted upon by the insurance companies before they accept a risk, and absence of compliance with which should be ground for rejection.

FOUNDRYMEN AT THE GRAPPENHALL WORKS.

The Richmond Gas Stove and Meter Company have recently had a visit to their Grappenhall Works, near Warrington, of the members of the Lancashire Branch of the Institute of British Foundrymen.

A good gathering of 80 members accepted the invitation, and were welcomed on arrival by Mr. J. W. Slack (Managing Director), Mr. Langford (Works Manager), Mr. W. H. Sherburn (Pattern Department), and Mr. H. Sherburn (Foundry Manager). The two last-named gentlemen are Past-Presidents of the Institute. The members were very much interested in the works generally, and the foundry in particular. The new cupola, which was nearly finished, was closely inspected, and the visitors seemed to take a keen interest in it. They were conducted over the works and subsequently entertained at tea.

After tea, the President of the Branch (Mr. H. Miles, of the Stanton Iron Company) proposed a vote of thanks to Mr. Slack and the Directors, and expressed the great pleasure of the visitors at having been permitted to go over such a well-equipped and up-to-date works, and at the hospitality which had been extended to them. This was seconded by Mr. Kenyon, of the Ewbank Company, and carried unanimously. Mr. Slack, in reply, said how pleased the firm were to see them, and how glad they were to note that they appreciated the visit. Mr. Langford also responded.

The visitors were conveyed back to the station, and thus ended a very pleasant afternoon.

A Big Natural Gas Burner.

The Southern California Gas Company have placed in service at a Crestmore portland cement works a burner, constructed by the Kirkwood Burner Company, which is 21 in. in diameter at its largest internal point, and approximately 4 ft. long. The weight of the burner is no less than half-a-ton. There are 25 1-in. pipes forming a helix, by means of which the gas is thoroughly mixed with the air. Each of these pipes is tapped with approximately 60 ⅛-in. openings for the passage of the gas into the mixing chamber. The air for combustion is entirely primary air, and is forced through a duct 18 in. in diameter. The gas consumed is straight natural gas which has a value of between 1150 and 1200 B.Th.U. During one week of test it averaged 1186 B.Th.U. The gas is delivered to the burner at a pressure of 60 lbs. The burner is set in a rotary kiln (previously fired by oil), 25 ft. long and 8 ft. in diameter, with an automatic feed. In consequence of the efficient combustion of the gas, the entire wall of the kiln is kept at a constant temperature of 2800° Fahr. This even temperature throughout the kiln was not secured when oil was used. Further, it was found that with the oil there was a tendency to produce a reducing flame, whereas with the natural gas, as employed in this case, only an oxidizing flame results. The cost of the process has been reduced.

"B.C.G.A." LIVERPOOL PROGRAMME.

The full programme has now been issued for the forthcoming thirteenth annual general meeting and conference of the British Commercial Gas Association, which is to take place in Liverpool, on Monday, Tuesday, and Wednesday, Sept. 29 and 30, and Oct. 1, under the presidency of Alderman H. Wade Deacon, C.B.E., J.P., the Chairman of the Liverpool Gas Company. The aims of the Association may be briefly stated as being, by a policy of co-operative action, to benefit the gas industry in particular by increasing its power to serve beneficially the nation in general.

ORDER OF PROCEEDINGS.

Monday, Sept. 29.

Lecture and Reception.

In the Liverpool Town Hall.

8.0 p.m. Lecture by Dr. C. W. Saleeby, F.R.S. (Edin.) on "Light and Life."

9.0 p.m. Reception by the Rt. Hon. the Lord Mayor of Liverpool (Councillor Arnold Rushton, J.P.).
Light Refreshments. Music.
Evening dress. Decorations will be worn.

Tuesday, Sept. 30.

Morning.

Private Conference.

In the Crane Hall, Hanover Street, Liverpool.

10.0 a.m. Assembly of members.

10.15 a.m. Welcome by the Rt. Hon. the Lord Mayor of Liverpool.

10.30 a.m. Presidential Address by Alderman H. Wade Deacon, C.B.E., J.P.
Announcement of President and Auditors for the ensuing year.
Papers—
1. "Gas in Biscuit-Making," by R. E. Gibson, Engineer of the Liverpool Gas Company.
2. "Gas as an Aid to Health," by the Manager of the Association, W. M. Mason.
3. Discussion.

1.0 p.m. Adjournment for luncheon.

Afternoon.

Official Visit.

2.30 p.m. Visit by delegates to Messrs. W. & R. Jacob & Co. (Liverpool), Ltd., Aintree Biscuit Factory, Liverpool. Members will meet at the Crane Hall at 2.30 p.m., when conveyances will leave for Aintree for an exceptionally interesting inspection of the application of gas in the biscuit-making industry.

4.15 p.m. At the kind invitation of Messrs. Jacob & Co., tea will be served.

7.15 p.m. Reception of guests at the Exchange Station Hotel.

7.30 p.m. Dinner by the Chairman, Alderman H. Wade Deacon, C.B.E., J.P., and Directors of the Liverpool Gas Company, to the President-Elect, Vice-Presidents, and members of the "B.C.G.A." and visitors.
Evening dress. Decorations will be worn.

Wednesday, Oct. 1.

Morning.

Annual General Meeting and Public Conference. 10.0—12.45.

In the Crane Hall, Hanover Street.

10.0 a.m. Assembly.

10.15 a.m. 1. Presentation of the annual report and statement of accounts, by the Executive Chairman, F. W. Goodenough.
2. Speech by the Executive Chairman on the aims and work of the Association.

11.0 a.m. "Art in Industry—The Influence of Beauty in Commerce and Industry." By Sir Lawrence Weaver, K.B.E., Director of United Kingdom Exhibits, British Empire Exhibition, 1924.

11.45 a.m. "The Worker and His Work—Human Relations in an Industrial Age." By the Rt. Rev. the Lord Bishop of Liverpool (the Rt. Rev. A. A. David, D.D.).

12.45 p.m. Adjournment.

1.15 p.m. Luncheon, at the Midland Adelphi Hotel, by the President-Elect, the Vice-Presidents, and members of the Association, to the President of the Association and the Directors of the Liverpool Gas Company.

CLOSE OF CONFERENCE.

A "Family Feeling" in the Empire.—In addition to the Fellowship of the British Empire Exhibition, it has now been decided to establish an Associate Branch, with a subscription of 5s. What is aimed at is to increase greatly the ranks of those who will pledge themselves to encourage a "family feeling" in the Empire, and it is hoped that both the Fellowship and the Associated Branch will be kept in existence after the close of the Exhibition. Associates will receive a certificate, a badge, and two single tickets for the Exhibition, and a portion of the subscription will be devoted to an Empire Scholarship Fund to help deserving young people to a "start in life" within the Empire. Forms of application, &c., may be obtained from the Committee, at No. 16, Grosvenor Gardens, London, S.W. 1.

NATIONAL GAS COUNCIL.

Central Executive Board.

The Central Executive Board of the National Gas Council met on Tuesday, Sept. 9, at No. 28, Grosvenor Gardens, S.W.

Election of Chairman and Vice-Chairman.

Upon the motion of Mr. Alderman Phillips, seconded by Mr. J. H. Ellis, Mr. D. Milne Watson was re-elected Chairman of the Central Executive Board for the ensuing year.

Upon the motion of the Chairman, seconded by Mr. C. F. Botley, the present Vice-Chairmen—Mr. Wm. Cash, Mr. J. H. Ellis, and Alderman F. S. Phillips—were re-elected for the ensuing year, and, in addition, Mr. Frank Jones was elected Vice-Chairman.

Report to the Board of Trade by Mr. W. J. A. Butterfield with regard to Carbon Monoxide in Public Gas Supplies.

A Committee was appointed to consider the recommendations in the above report.

"Coal and Power."

Resolutions from various Gas Associations were submitted, all urging that pressure be brought to bear to prevent the subsidizing by the State of grandiose electrical schemes, without due consideration being given to the whole question of fuel resources.

Mains of Insufficient Capacity.

It was reported that the clause with regard to relief from obligation to give a supply of gas where the mains were of insufficient capacity had been contested when the Pinner Gas Company's Draft Order under section 10 of the Gas Regulation Act came before the Select Committee of the House of Commons on July 29. The railway companies had asked that this clause be struck out of the Order, but it was pointed out that this would mean that the Gas Company would be obliged to meet any demand for industrial gas which might be made upon them, involving considerable capital expenditure without any assurance of an adequate return or the permanency of such industrial supply. The Select Committee appeared to be of the opinion that some protection was necessary for the industry with regard to speculative industrial supplies, but felt that the existing clause was too broadly worded to exclude the possibility of injustice being done.

The Select Committee had decided to adjourn until after the parliamentary recess, in order that the Gas Company, the Railway Company, and the Council might consider the position further with a view to agreeing a suitable clause.

Finance Act, 1924.

It was reported that the Finance Act, 1924, contained three sections of interest to gas undertakings.

(1) Section 33 enacts that every warrant or cheque drawn or made after Nov. 30, 1924, in payment of any dividend or interest distributed by any company, shall have annexed thereto, or be accompanied by, a statement in writing showing (*a*) the gross amount which, after deduction of the income-tax appropriate thereto, corresponds to the net amount actually paid; (*b*) the rate of income-tax appropriate to such amount; and (*c*) the net amount actually distributed. In the case of companies who declare dividends "free of tax," it will be necessary to calculate in respect to each warrant the amount of gross dividend which, after deduction of tax, will leave the sum actually paid. This section applies to all companies "within the meaning of the Companies (Consolidation) Act, 1908, or a company created by letters patent, or by or in pursuance of any Act of Parliament," under which last category statutory gas undertakings would be included.

Section 34 provides for the termination of the corporation profits tax as from June 30, 1924. It was pointed out that, owing to the efforts of the Council, *statutory* gas undertakings have never been liable to this tax.

Section 36 amends the First Schedule to the Stamp Act, 1891, and exempts from the 2d. stamp duty (as from the date of the Royal Assent—*i.e.*, Aug. 1, 1924)—

> Receipts given for or on account of any salary, pay, or wages . . . or for or on account of money paid in respect of any pension, superannuation allowance, compassionate allowance, or other like allowance.

Rating.

(*a*) *Assessment of Gas Undertakings.*

It was reported that a further case had been submitted to the Council, of a gas company in Bedfordshire where Sir Trustram Eve was putting forward a new basis of assessment, and that the Council were taking Counsel's opinion in the matter.

(*b*) *Rating of Machinery—Proposed Evidence before Departmental Committee.*

It was reported that the Rating Committee appointed by the Board had met on July 23, Aug. 13, and the 8th inst., and—as previously reported—had discussed the definition of the Federation of British Industries of "First Motive Power Producing Plant," which aimed at excluding electrical machinery from rating. It was pointed out that a very important aspect of the question was that indicated in a letter from the Machinery Users' Association—viz., that the object was to exempt, as largely as possible, machinery. This being so, gas undertakings in an industrial district would have to pay an even higher and more disproportionate sum in order to make up the loss on revenue in such district.

It was proposed to obtain, if possible, statistics showing what proportion industrial assessments bear to the total rateable value in different districts, and to ascertain what proportion of the industrial assessments is borne by the rating of machinery to-day. It was agreed to co-operate with the Property Owners' Association, and that the Council should prepare evidence to be submitted by Mr. William Cash to the Departmental Committee.

Disqualification of Directors of Companies as Members of Local Authorities—Judgment of the Late Mr. Justice Bailhache.

Reference was made to the decision of the late Mr. Justice Bailhache, that a managing director, or apparently any director, was disqualified from being elected or from continuing a member of a municipal council, if he had any share or interest in any contract, &c., with such council. It was agreed to await the result of the appeal that had been lodged against this judgment; and meanwhile the Council have communicated with the Federation of British Industries, asking whether they propose to take any steps in the event of the judgment being upheld.

Traders' Co-ordinating Committee.

It was agreed that the Council should make a further contribution towards the fund raised by the above Committee, as it is absolutely essential that the good work accomplished by them with regard to railway rates should not be hampered.

Water Supply to Geysers.

It was reported that difficulty had been experienced with the Metropolitan Water Board in regard to the installation of geysers within the Board's area of supply. The history of the regulations of the Metropolitan Water Board was outlined; one of these regulations—which date from the year 1872—being that every "boiler" must be supplied with water through a cistern, and not be directly connected with the Water Board's main. After lengthy negotiations, the Metropolitan Water Board had written on July 18, informing the Council that the Works and Stores Committee had adjourned consideration of the general question of water supply to geysers, with a view to obtaining a further report, and that in the meantime they had given instructions that geysers might continue to be connected as had hitherto been the practice, provided there was a break in the water supply between the tap and the body of the geyser.

This arrangement was unsatisfactory, even as a temporary provision, and it was agreed that if, as the result of further consideration, the Metropolitan Water Board could not agree to relax this regulation in the case of all geysers, every possible step would have to be taken with a view to the amendment of these antiquated regulations, which were drafted fifty-two years ago, when geysers were practically unknown, and were quite unsuited to the needs of the present day.

Sale of Coke—Report of the Public Control Committee of the London County Council.

It was reported that since this question was considered at the June meeting of the Board, the Chairman of the Public Control Committee had withdrawn his Committee's report, pending a deputation from the Society of Coal Merchants. A report of the Public Control Committee was made on July 11, and the London County Council were advised that no effective legal action with regard to short weight in deliveries of coke was possible under the existing law. The report went on to state that the question of short weight could be avoided by the method of sale, and the plan adopted by the London Gas Companies of selling coke by weight proved that a fair basis of sale was possible by this method. Coke merchants, on the other hand, usually quoted coke to the public by the chaldron or by the sack. It was suggested in the report that it should be made an offence to water coke with a view to fraudulently increasing its weight. It was proposed to secure a simple amendment to the Weights and Measures Act of 1889, bringing coke under the same control as coal; and a copy of the resolution on the matter has been forwarded to the President of the Board of Trade.

When this question comes before Parliament, the interests of the industry will be safeguarded by the Council acting in conjunction with the London Coke Committee.

Board of Trade Inquiry into Trade and Industry.

Reference was made to the Committee of Inquiry set up by the Board of Trade "to inquire into and report on the conditions and prospects of British industry and commerce, with special reference to the export trade, and to make recommendations in regard thereto." It was agreed that, if at a later stage such a course was considered desirable, the Council should submit evidence.

Flame Propagation.—In a paper on this subject submitted to the Gas and Fuel Section of the American Chemical Society, Mr. F. W. Stevens states that a gaseous explosion, starting from a point of ignition, is the spatial propagation of a zone of reaction marked by flame, and that the determination of its rate of movement in space, as is usually done, is of little scientific value. Its rate of movement relative to the gases themselves, whose transformation it is progressively effecting, is their rate of transformation. It is found that this rate is proportional to the product of the concentrations of the active gaseous components.

THE CONSTITUTION, ELECTION, AND TRAINING OF DIRECTORS.

By J. H. BREARLEY, M.Inst.C.E.

There are so many things in the series of articles by "A Gas Engineer" in which he challenges combat, that it is rather surprising a volley or two have not been fired into his "castle," even though the "enemy" is not in sight. A few turrets would be lopped off if those whose principles and practices have been subjected to "Gas Engineer's" indiscriminate sniping had regarded an answering fire as worth while. The articles are very readable, and much may be excused in that the writer shows no reverence for things merely because they have become customary. It is good exercise, now and then, to stop and think. "Gas Engineer" writes in the style of a Daniel come to judgment. When it is all sifted, however, the general conclusion come to will be that matters are going pretty well, and that, on the whole, there is little to worry about.

"Gas Engineer's" line of reasoning is very superficial. It leads him to conclusions, the error of which can be fairly measured by the emphasis with which they are set down. Let us take as a typical example the references made in the issue of the "JOURNAL" for Sept. 3 to the constitution, election, and training of directors. "Gas Engineer" says that, on the distribution side at all events, education is needed by directors, and shareholders need education as to the type of director they should elect. It is admitted, then, that the competence of directors leaves much to be desired, and that the shareholders' ability to elect the right men is not above proof. And so, directors and shareholders are to be educated! Who is to be the schoolmaster? The average chief administrator on the technical side has enough to think about, heaven knows, without having this additional burden thrown upon him as one of his "list of duties." It is well-known, however, that in a voluntary and tactful sort of way most engineers or managers of gas undertakings are continually engaged in improving the faculties of the boards to whom they must turn for decisions on high matters of state and policy. But such efforts have to be very tactful, or the last state would be worse (for the engineer or manager) than the first.

I remember many, many years ago allowing a brother gas engineer, who now occupies a high position in the gas industry, to look over the annual report which I had submitted to my (then) board of directors. At the end of it he said, "You tell them too much." Were it not too much of a digression from the immediate purpose of this critique, I could furnish abundant evidence that an intelligent board of directors can never be told "too much." Sufficient to say that my own experience has been that the more competent the directorate, the less trouble there is in getting through important schemes for the development of gas undertakings. Conservatism always lurks in the minds of incompetent boards, of which, needless to say, one cannot wisely quote examples.

At this point, as it is so pertinent to the subject, I take the liberty of quoting freely from the address which I gave to the Manchester District Institution in 1906:

> "In many instances, engineers under local authorities have little or no chance to run the gas undertaking on sensible business lines. No sooner have the members of one committee—chiefly due to instruction from the engineer—learned to look at the questions which come before them from a proper and intelligent perspective, than another election is due, which, likely as not, brings further recruits possessing no more knowledge of gas administration than a sixth form schoolboy. In this way half the energies of the gas engineer are sapped by tuition work, not infrequently attended by worry. Likely as not the recruits have formed totally erroneous ideas of their duties, and of the business they are expected to control. The engineer, unlike the schoolmaster, must never forget, however, that, though tutor, he is but a servant. With many it has come to be a trite saying that, difficult though it is, it is much easier to manage the works than the committee. To this class of worry the company manager is usually a total stranger. He can almost invariably rely upon that technical and businesslike support which is begotten of continuity of control.
>
> "If those in control of municipal trading concerns could be induced to record an answer to the question 'Are you prepared to accept a position under a company at the same rate of remuneration as you now obtain?' what would the answer be? Almost unanimously 'Yes.' But is such a condition of unrest (using the word in its academic sense) calculated to produce the highest degree of success in municipal undertakings? Emphatically, 'No.'"

"Gas Engineer" confines his remarks to the constitution of *company* directors, but in the matter of education the need is infinitely more pressing in the case of committees which control local authority gas undertakings. His prescription for the form of education is that the services of the "B.C.G.A." and the Technical Press be invoked. I have always understood that the chief work of the "B.C.G.A." lay in doing that form of propaganda or education which cannot be done as well or better locally. Any attempt of the "B.C.G.A." to "educate" directors and shareholders, if detected, would do incalculable harm to the unity of that organization. Where education is necessary, the only man who can do it discreetly is the man in charge. Like the "B.C.G.A.," he must remember that the board of directors or committee are the paymasters. Whereas anything the "B.C.G.A." might do would be so tangential as to miss its mark, the engineer knows how far he may go in the educational direction, and can get in useful work across the board-room table.

If the education of a board of directors or a committee is lacking, it is doubtless a good thing, within practicable limits, to attempt a remedy. It is a much better thing, however, to have a board or committee that need no education. It is therefore most amazing that "Gas Engineer," who is so obviously concerned about the standard of ability in boards of directors, should deliberately seek to disfranchise from election those men who possess the highest credentials. "Gas Engineer" says:

> "No man should be elected a director as a recognition of services rendered either as engineer or secretary. To do so is wrong in principle, as it unfairly handicaps his successor. Much harm is done by such procedure; and the more successful the retiring man, the greater the handicap on his successor. Moreover, the longer a man has been in charge the more wedded he will be to the methods which have, in his opinion at any rate, been so successful, and consequently the less likely he will be to consider fairly and adjudicate justly upon new, and possibly drastic, proposals which it is almost certain a new man will bring forward."

It would hardly be possible to lay hands upon more loose thinking in so small a compass. Let us analyze it. To begin with, a man is usually elected to a board of directors because, in the shareholders' view, he is considered the most competent for the vacancy. Such elections are not in the nature of rewards for long service, though it is not surprising that long service, particularly if coincident with success and ability, should count as a qualification for the board. Then we have it that such elections handicap the successor. The point here to be kept in mind is that it is not the well-being of the successor, but of the gas undertaking, which the shareholders must keep in view in making elections to the board. If a successor is competent, how can he be handicapped by having on the board engineers or secretaries who have come up against similar problems as beset him during many years of faithful service? "Gas Engineer" says that the more successful the retiring man, the greater the handicap on his successor. In other words, on his line of reasoning, the greater the ability of the new director the less equity there is in giving him a seat on the board. We have the incongruity of the same voice belabouring boards of directors for not being sufficiently educated or competent, and attacking the practice of electing individuals to the board who are highly educated and competent. And why? In the interests, professedly, of the new engineer and manager. Thus we have it held up that, while ignorance in the board of directors should be dissipated, there must not be *too much* knowledge, lest the tribunal which sits in judgment upon the various recommendations of the chief engineer shall be too critical of those recommendations. This attitude is not merely subversive of the interests of the gas industry, but is a libel on the fairmindedness of those who have spent their most active lifetime in the service of a gas undertaking.

It is one of the marks of a successful gas engineer that he is ever ready to consider carefully any new proposal for improving the process of gas manufacture and its distribution, including the extension of gas usage. What ground can there be, therefore, for asserting that the mere process of transposing a man from the seat of the successful gas engineer to the chair at a board meeting will immediately cause a revulsion to conservatism? The truth is, that the more competent the board, the more likely the engineer or manager is to be kept up to concert pitch. The man with the keenest desire for service desires nothing better. In the years to come he will be thankful that he served in this disciplinarian school while yet he had, maybe, great ability, but not that sound judgment which comes from mature experience.

"Gas Engineer" says that most boards of directors can be safely trusted not to rush into "wild cat" schemes. Evidently he has in mind the possibility of "wild cat" schemes being put forward. The average shareholder will doubtless consider the insurance against "wild cat" schemes is bigger when one or two seats on the board are held by men who have the capacity, through life service, to give sound judgment between wise and "otherwise" schemes, for which task they need tuition neither from the engineer nor the "B.C.G.A." As a matter of actual experience, any number of cases could be unearthed where the greatest stalwart of the engineer or manager in charge has been the "ex-service" man, who has been most readily convinced of the correctness of the policy set forth.

One cannot help thinking that there is something of personal disappointment in "Gas Engineer's" strictures upon gas engineers or other long service men serving upon boards of directors. We have only to test the logic of it, as a final criticism, by saying that, were "Gas Engineer's" "principles" to be put into effect, the following would be unseated from various boards upon which they serve: Dr. Charles Carpenter, Mr. Charles Hunt, Mr. David Milne Watson, Mr. H. E. Jones, Mr. Thomas Goulden, Mr. A. E. Broadberry, and Mr. William Cash. There are a host of other ex-engineers, &c., who are contributing yeomen service to the gas industry round the board-room table. It is hardly credible that any self-respecting gas engineer would argue that such men, after reaching the stage when they feel disposed to stand aside for younger blood in the exacting post of chief in the engineering, managerial, secretarial, or accountancy department, should be cast aside. Fortunately, there is no danger of it; but since "Gas Engineer" has sought by anonymous publicity to express sentiments which are not infrequently heard on occasion privately, it is well that the other side should receive like prominence.

PROGRESS AT IPSWICH.

As Evidenced by the Gas Offices and Showroom.

Ipswich possesses many features which the townspeople regard with pride, and by no means the least of these is its Gas Company. So much was evident from remarks which were made in the course of a pleasant little function on Wednesday last, when, also, proof was forthcoming of the sure foundation on which this pride in the Company is based. The occasion was the re-opening of the town offices and showroom after alterations, and those taking part in the ceremony included about fifty gentlemen representative of the civic and business life of the town. The Borough Member (Mr. R. F. Jackson, M.P.) was there, and so was his Worship the Mayor of Ipswich (Dr. J. R. Staddon), together with Aldermen F. E. Rands, J. H. Grimwade, C. E. Tempest, W. Pipe, and H. M. Jackaman. There was the Town Clerk (Mr. Will Bantoft) and the Medical Officer of Health for the Borough (Dr. A. M. N. Pringle), while among others present was Col. P. D. Ionides, D.S.O. A warm welcome was extended to the guests by Mr. Henry Woodall, M.Inst.C.E., J.P. (the Chairman and Managing Director), Mr. Hugh Turner (Vice-Chairman), and Messrs. Henry Miller, M.Inst.C.E., George H. Hewetson, and P. Wyndham Cobbold, LL.B., J.P. (Directors). Mr. Frederick Corder (another member of the Board) was unfortunately absent through indisposition. All information desired was easily obtainable, for those who had it at their fingers' ends were eager to supply it. This reference, of course, is, in particular, to Mr. Frank Prentice (the Engineer and Manager), Mr. G. Ambrose Mallett, A.C.I.S. (the Secretary), and Mr. W. A. Garrard (the Gas Sales Superintendent).

A Handsome Showroom.

Carr Street, in which the town offices and showroom are appropriately situated, is one of the main business thoroughfares of Ipswich, and there is general agreement that the Directors took a wise step in purchasing the site over thirty years ago. The period that has since elapsed has witnessed a remarkable development in the business of the undertaking. In 1892, when the showroom was first opened, the yearly output of gas was 178 million c.ft., whereas it is now no less than 673 millions. In the same time the number of consumers has grown from 3955 to 19,593, and the turnover from £35,000 to £164,000. These figures are amply sufficient to justify the extensions which the Board decided to make, and which have now been brought successfully to completion. The services were requisitioned as Architect of Mr. E. T. Johns, and he drew up a scheme by which, as the Chairman said at the opening, his "already high reputation will be enhanced." Mr. Sadler, as builder, has also carried out his work well, and the result is a job with which everybody is pleased.

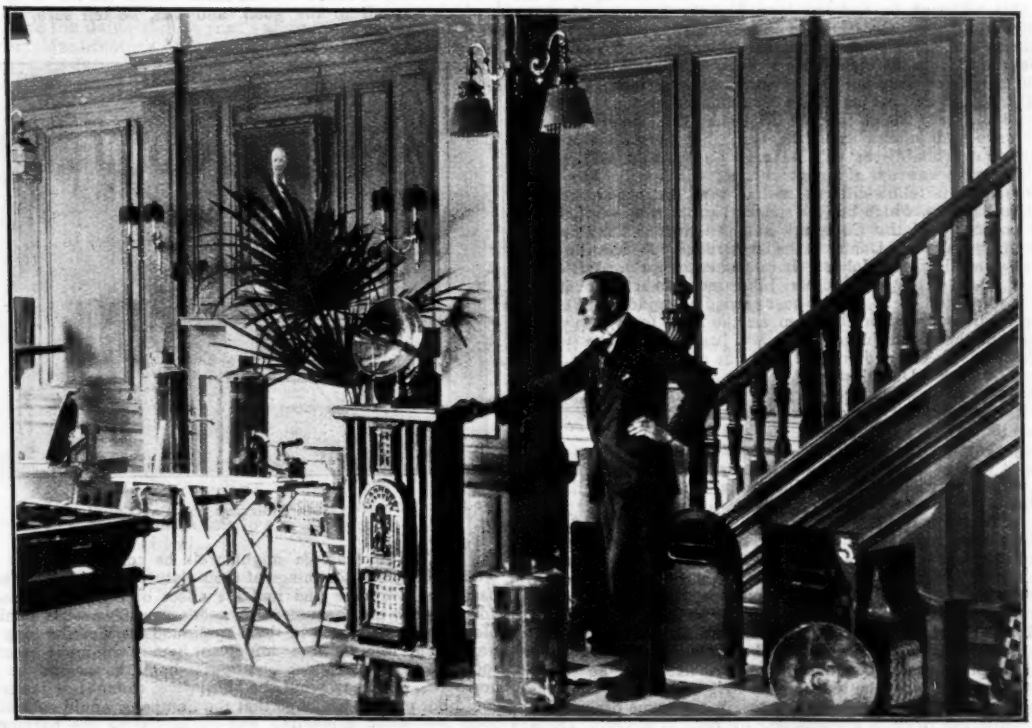
On either side of the main entrance to the premises is a spacious show window, which at the time of the inspection contained a good selection of gas fires and cookers. It has, however, been wisely determined to alter the display weekly, and so maintain public interest. The window space (the level of which is raised from the showroom floor level by about 1 ft.) has, indeed, been specially arranged to enable this to be easily carried out. The exterior lighting is by four 1500 c.p. Keith-Blackman high-pressure lamps, which are supplied with gas from the high-pressure main that runs through Carr Street and other principal thoroughfares of the town.

Entering, one is faced by the counter (arranged at the other end of the showroom) at which ordinary consumers may pay their bills; and, of course, this arrangement has been made so that the customer's attention may be drawn to the latest apparatus for securing efficiency and comfort by the aid of gas. Every effort has been made to avoid any suggestion of overcrowding of goods. Down each side, almost from door to counter, near the centre of the green and white marble floor, and raised to about the level of the show windows, is a platform on which well-selected samples of the most modern appliances, by the leading makers, for cooking, warming, water heating, and other domestic purposes, are set out; and as will be seen from the photographs here reproduced, an excellent selection has been made. A good idea has been the connecting-up of a "Fairy" gas iron, and the provision of a particularly taking folding ironing board, to which any customer is welcome to bring along her own goods, and ascertain for herself how great can be the assistance of gas in what is likely otherwise to prove an irksome domestic duty. Ironing by this up-to-date method, the customer learns, costs ¼d. an hour at the Ipswich charge for gas of 9d. per therm.

The showroom is handsomely fitted with oak, and probably it is the only room in the town which is so provided with 12 ft. high Georgian type panelling. Messrs. F. Tibbenham, Ltd., were responsible for this part of the work. Thoroughly in keeping with its surroundings is a 16-in. Davis "Jacobean" gas-fire, finished in oxidized silver. This is used for warming purposes, and is set in light grey marble, with massive oak overmantel. On either side are oxidized silver Evered candle brackets; and an harmonious effect is secured by many of the other fittings and appliances throughout the showroom being of the same finish. Above the overmantel is a feature which will strike all those entering the premises who have a knowledge of the history of the Ipswich Gas Light Company—that is a first-rate portrait in oils of the late Chairman, Sir Daniel Ford Goddard, which was also executed by Mr. Johns, who has thus shown himself to be, in addition to an architect of ability, a portrait painter of distinction. Elsewhere on the walls are some Sugg "Flambeau" lights, while suspended from the ceiling are choice samples of Bland inverted fittings. A neat placard in the window invites passers-by to step in and inspect all that is to be seen, as well as to seek advice on any gas matter with regard to which they may be in doubt. The handsome main staircase, which is clearly shown in one of the photographs, leads up to the Engineer's and the Secretary's offices. By the improvements effected, the old showroom has been extended to about double its original area.

In the Offices.

As already mentioned, the scheme included extensive alterations to the office accommodation, which, again, had to be effected on a site which is restricted, having regard to the growing require-



VIEW SHOWING PORTRAIT OF THE LATE SIR DANIEL GODDARD.

ments of the Company. Passing behind the pay counter in the showroom, one enters the new clerks' office, fitted up with the most modern labour-saving devices. This, as is the case with some other parts of the premises, is lighted by Sugg "Bon Marché," six-light, semi-indirect lamps, with opal reflectors and bowls, which impart a restful effect most suitable for this style of building. A special office, with separate entrance, is set aside here for dealing with rebates, complaints, &c., relating to the 16,000 or so slot consumers. Behind the clerical department are workshops and stores, which have been very much enlarged, and in which some fifty or sixty fitters are employed. It may be noted that a big Fletcher gas oven is used in connection with the cleaning of cookers. Nearby is the gas engine installation for compressing the gas used in the high-pressure lighting. Upstairs well-appointed staff dining room and kitchen are provided, and the ordinary rental department is housed. This portion of the premises has a well and a top-light which furnish natural illumination to the clerks' office below. What has been referred to in this paragraph is the new part of the premises.

Arrangement of Cooking and Water Heating Apparatus.

In the basement is a big strong room, and here also is provided the hot water supply of the building. A large and a small coke boiler furnish hot water respectively for general purposes and for hand basins, &c.; while a Wright "B.T.U." boiler will provide auxiliary water heating.

SOME SPEECHES.

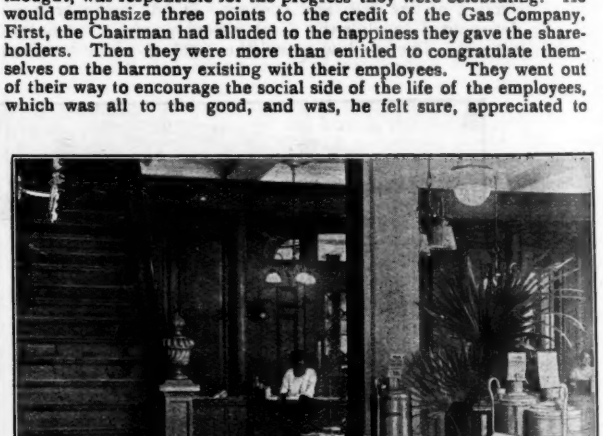
Luncheon was set out in the Secretary's office (which is also the Board Room), and was followed by a short toast list. After honouring "The King,"

The CHAIRMAN proposed "The Town and Trade of Ipswich," and extended a hearty welcome to all present. As a stranger to most of them, he felt a little diffident. He was, however, encouraged in the thought that although he had not long had the honour, which he valued highly, of being Chairman of this Company, he had received such kindness and consideration from his colleagues, and such loyal and efficient help from the chief officers of the Company, that he felt the people of Ipswich were not unkindly disposed to strangers in their midst. During the day one name had been often in his thoughts—that of his friend and their friend, the late Chairman, Sir Daniel Goddard. He would have been in his element that day. He was distinguished in many ways, but probably the title he most appreciated, and one he certainly deserved, was that of a good citizen; and he would have delighted to meet his fellow-citizens, and to take them over the new showroom and offices, which he (the speaker) hoped they would agree were not unworthy of the Company and the town. They had all noticed the portrait of Sir Daniel in the showroom. It was the work of their versatile friend Mr. Johns. It was an excellent portrait and a fine work of art, and they thanked Mr. Johns most sincerely for it. It would serve to remind them—if they ever needed a reminder—of a man who did splendid service for the Company and the town. It was a good thing that the recent judgment of Mr. Justice Bailhache (whose sudden death he was sorry to read of) did not occur to prevent, as it might have done, Sir Daniel serving both town and Company. He (the Chairman) could not believe this judgment would be allowed to stand, as it would deprive the country of the services of some of its ablest councillors.

Referring again to the showroom and offices, the Chairman mentioned that it was 32 years since the former was first opened. At that time the output of gas was 178 millions; now it was 673 millions. The number of consumers then was 3955; now they numbered 19,593. The turnover then was £35,000; now it was £164,000. These figures justified the extensions. When the Board decided on the alterations, they placed the work in the hands of Mr. Johns, knowing he would give them a good job, and they had got one. He thought they would all agree that Mr. Johns' already high reputation would be enhanced by this, one of his latest works. He would also like to thank the builder, Mr. Sadler, for the way in which he had carried out his contract. The Company had always prided themselves on selling gas cheaply. The price was higher than they would like; but he would give them figures to explain the reason. In 1923 the price of coal was above the price in 1913 by 84·3 p.ct.; wages in the same period rose 148 p.ct.; while the price of gas was now up only 44·6 p.ct. These figures showed that they had increased their efficiency, and he promised them they would continue to do their best in this direction. It had been said that a man could not serve two masters, and he believed this generally to be true; but the Directors were serving three masters, with some success. They served the shareholders who appointed them; the workpeople who worked for them; and the consumers who took their product. Under the sliding-scale of price and dividend, and the co-partnership scheme, the advantage of one was the advantage of all. If the Company reduced the price of gas, the shareholders and the workmen benefited, and also the consumers. The consumer, however, was chiefly considered. For every reduction of 1d. per therm, the workmen received £360, and the shareholders £1500, while the consumers got in the reduction of price £12,000. He knew it was difficult to conduct most businesses on these lines, but it was a system which tended to general content. They had, he thought, satisfied all the three bodies they served, and they intended, by increasing efficiency, to keep their goodwill. He had little fear as to this, as they had a most excellent staff, and a body of good and, he felt sure, contented workpeople. The gas industry was by some people thought to be a dying one. On the contrary, it had never been more progressive, and consequently more prosperous, than to-day. It might interest any medical gentlemen present to know that the district of the Gas Light and Coke Company in which there was most gas sold per acre was the Harley Street area, which was almost entirely occupied by medical men and nursing homes. Unfortunately gas was sometimes used as a convenient way of ending life, but it had saved many lives by its adaptability and cleanliness. For the sake of the health of people living in cities, he felt sure that the use of gaseous fuel would be more and more insisted upon. The Company had severe competition from the Corporation electricity station, but there was room for both of them, and competition was good for both—provided that they were not out to harm each other's business, but only competing to give the best service to those who required light, heat, and power.

The MAYOR, whose name was coupled with the toast, in responding, congratulated the Company on their splendid improvements, which were of use to themselves and an advantage to the people of the town. As representing the Corporation, he recognized that they were to a certain extent trading against the Gas Company, for the Corporation also ran a very fine lighting and power installation. It showed the way in which the town was progressing that both turned out large profits. The Electricity Committee showed the greatest profit of all the Committees. He believed the shareholders of the Gas Company were reaping advantage from the way in which the undertaking was carried on, and could only hope that both would be able to work together, for some years to come, in perfect unity. It was recognized that competition was good for both.

Mr. R. F. JACKSON, M.P., proposing "The Ipswich Gas Light Company," remarked that most of them were so closely associated with the late Sir Daniel Goddard that they had, so to speak, come to love the whole of his works, including the Gas Company. He thought the late Chairman's fine example safe in the keeping of his successor. There were others who could speak from the public point of view with far greater knowledge than he could, but he (Mr. Jackson) had been concerned with the Paving and Lighting Committee of Ipswich, who were really the guardians of the consumers' interests. Their relationship with the Gas Company had been most happy, and they had always found the Company amenable to suggestion. This, he thought, was responsible for the progress they were celebrating. He would emphasize three points to the credit of the Gas Company. First, the Chairman had alluded to the happiness they gave the shareholders. Then they were more than entitled to congratulate themselves on the harmony existing with their employees. They went out of their way to encourage the social side of the life of the employees, which was all to the good, and was, he felt sure, appreciated to the full. The example might well be copied by other companies who had not the advantage of their statutory position. Then the co-partnership scheme had had the effect of cementing relations, with advantage to the consumer. Another aspect was the number of employees who had been in their continuous service for long periods of time. The last and most important item in the make-up of their prosperity was the consumer—without whom they would be absolutely nowhere. He knew what the housewives thought of gas cookers, and could but express the hope that the Company would continue to make good gas, while cementing and consolidating the harmony existing between them and their workmen. He had to associate with the toast



Main Staircase and Pay Counter.

of the Company the honoured name of Mr. Hugh Turner, a member of an Ipswich family which was well-nigh an Ipswich institution.

MR. HUGH TURNER, responding, remarked that in the supply of gas the Company met a great public demand. The uses of gas were varied, but probably 16,000 to 17,000 homes in Ipswich and suburbs depended on gas for cooking the daily meals. The Directors believed in keeping their works, plant, and premises thoroughly up to date, and their policy had always been to sell gas at the lowest possible price. This price had again been reduced from the beginning of the present quarter. It might interest those present to know that since the co-partnership scheme started £6687 had been paid to employees as bonus; and the employees now owned over £5000 of stock in the Company, which showed they made good use of their bonus. When employees could obtain in this way stock in the Company, it gave them a much greater interest in their work. If this principle of co-partnership could be extended to other industries, it would probably do much to improve relations between labour and capital.

CITY AND GUILDS EXAMINATIONS PROGRAMME.

The issue of the programme now makes available information with regard to next year's technological examinations of the City and Guilds of London Institute. The programme, which is published by John Murray, of Albemarle Street, W., at the price of 3s. 6d. net (postage extra), contains general regulations for the session 1924-25, syllabuses for examinations, &c. It should be added that copies are obtainable through Messrs. Lamley and Co., of Nos. 1 to 5, Exhibition Road, London, S.W., or any bookseller; while all inquiries relating to the work of the Department of Technology should be addressed to the Superintendent, Department of Technology, City and Guilds of London Institute, No. 29, Roland Gardens, S.W.

With regard to the alterations in the programme as compared with those for previous sessions, it is noted that the syllabus of the former subject of Gas Engineering has been modified, and the examination is now styled Gas-Works Practice. It is, however, stated that the syllabuses in Gas-Works Practice and Gas Supply Practice are under consideration, and will receive further revision in the programme for 1925-26, with a view to co-ordination of minor courses in these subjects with the examinations of the Institution of Gas Engineers in major courses. Separate examinations will be held in 1925 in Gas-Works Practice; Gas Supply Practice, including Distribution and Application; and Gasfitting.

As usual, the names appear of the members of the Advisory Committees, and in addition the Department state that they are able to avail themselves of the advice of a number of bodies, including the Council of the Institution of Gas Engineers. In connection with gas-works practice and supply, the name of Mr. Charles Hunt appears as Honorary Consultative Examiner. The Active Examiners for the year 1924-25 for the subjects in which readers of the "JOURNAL" are specially interested are: Coke and Bye-Products Manufacture, Mr. C. P. Finn; Coal Tar Distillation and Crude Intermediate Products, Mr. W. H. Coleman; Gas Supply Practice, Mr. H. Kendrick; Gasfitting, Mr. R. J. Rogers; Heating and Ventilating Engineering, Mr. A. H. Barker. The Examiner in Gas-Works Practice had not been appointed at the time of the printing of the programme.

The following are the dates of next year's examinations: Coke and Bye-Products Manufacture, Wednesday, April 29; Coal Tar Distillation and Crude Intermediate Products, written, Thursday, April 30, and final, practical, Saturday, May 2; Gas-Works Practice, Saturday, May 9; Gas Supply Practice, Saturday, May 2; Gasfitting, written, Monday, April 27, grade II. and final, *viva voce*, Saturday, April 25, grade II. and final, practical, Saturday, April 25; Heating and Ventilating Engineering, grade I., Friday, May 1, grade II. and final, Wednesday, April 29. In connection with the syllabus for each examination, candidates will find, in an appendix, a list of text books and works of reference bearing upon the subject of the examination, as well as the names of appropriate periodicals.

Among the special prizes, the Society of British Gas Industries offer prizes of £5 5s. and £2 2s. to the first and second candidates respectively at the final examinations in Gas-Works Practice, Gas Supply Practice, and Gasfitting; and Messrs. Benn Bros., Ltd., offer a prize of a specially autographed copy of the latest edition of Meade's "Modern Gas-Works Practice" to the first candidates respectively at the grade I. and final examination in Gas-Works Practice, provided that such candidates are eligible under the regulations. The Institution of Heating and Ventilating Engineers also offer prizes in their special subjects. In addition to these, silver medals are offered by the City and Guilds of London Institute on the results of the final examination, and bronze medals on the results of the examination in the grade next below the final, in all technological subjects.

Southern Association of Gas Engineers and Managers (Eastern District).—There is to be a meeting of the Eastern District of the Association at 2.30 p.m. on Sept. 23, in the Board Room of the House Committee, No. 28, Grosvenor Gardens, S.W.

Gas Cooking Apparatus at Holyrood Palace.—We have been informed by Messrs. R. & A. Main, Ltd., of London and Falkirk, that they have been successful in securing the contract for the gas cooking apparatus at Holyrood Palace, Edinburgh.

LOSSES.

By NORTON H. HUMPHRYS.

One of the tendencies of human nature—a subject that may be carefully studied with advantage by those connected with the sales side of the gas industry—is to run to extremes, and extremists are always more pushing and self-assertive than moderates. How frequently we see a handful of the one controlling a crowd of the other. In business, gains are apt to be over-valued, and losses unduly regretted. Success in any enterprise is greatly assisted by ability to make rapid but accurate valuations. Gains should not be blindly accepted as a permanency, but subjected to full examination; and losses are not necessarily unavoidable or beyond recovery. "It is no use crying over spilt milk," "Locking the stable door after the horse is stolen," and similar proverbs, are not of a sort that commends itself to energetic salesmen. They prefer endeavours to recover some of the spilt milk, or to trace and re-capture the horse.

Undoubtedly their efforts should be strongly applied in the direction of paving the way towards new business, but limitation to that line alone means a stunted and one-eyed selling department. There is a notable difference between "cheap jack" selling methods and those of a gas company. The peripatetic retailer can do with a trifling capital as compared with his turnover, and incurs no permanent liability. But gas undertakings must spend large sums on manufacturing, purifying, storage, and distribution plant, followed by outlay on each consumer for service, and probably appliances on hire terms. In addition to first outlay, there are annual expenses for repair, maintenance, and establishment charges, not influenced by the quantity of gas consumed. A large part of the outlay consists of wages, and cannot be recovered. The bulk of the material will barely pay cost of removal, though meters and cookers may be utilized elsewhere if worth it. Very rarely does the consumer have the supply disconnected and the service taken out; he reduces consumption to stand-by dimensions, with the result that, while the annual expenses remain unaltered, the receipts are reduced to a degree that is not sufficient to cover them. If one consumer does not pay his own footing, others must make up the deficiency.

The establishment of a new business, or subsequent extension, depends upon "expectations"; and the larger the necessary preliminary outlay, the greater the need for accurate foresight in the valuation of "expectations" and prospect of remunerative business. Experience in sales of gas has accumulated to such extent that a fairly reliable forecast of the total expectation can be set out. As regards individual items, there is difference between promise and performance. The man who was always agitating, in season and out of season, for a supply of gas to the district, may prove an unprofitable consumer; and another who roundly abused the mainlayers as a superfluity, when they were working outside his front door, may within a twelvemonth have a gas cooker in his kitchen, gas fires in the living rooms, and a geyser in the bathroom. But the laws of average come in as a sort of flywheel, and the total consumption is not far removed from the figures shown by a competent forecast.

Recent advances in cost of material and labour add to the importance of a correct valuation of expectations. In pre-war days, a prepayment consumer (prepayment and quarterly are more definite terms than automatic, slot, or ordinary) could be supplied with service, meter, cooker, and two lights, complete, and yet leave some change out of a £5 note; but an outlay of not less than £10 to £12 is required to provide a similar installation to-day. The cost of meter and service for a quarterly consumer has risen in like proportion. For many years, the element of possible loss was scarcely thought worth notice, but this state of things does not now exist. The word "permanent" decreases in value with every advancing year, and expectations should include possibilities of losses to a greater extent than was formerly sufficient. The public are more unstable and partial to something new. Among other things, bad times, depopulation, and personal prejudice have acquired greater importance.

The total increase in sales of gas, as compared with the previous year, whether stated as a percentage or as a concrete quantity, is only one part of the story. The first is a function of a variable. Suppose that an even increase of 10 million c.ft. per annum is spread over a period of five years, on a commencing total of 100 millions per annum.

—	Total Annual Sales.	P.Ct. Increase on Last Year.
	Million C.Ft.	Million C.Ft.
	100	
1st year	110	10·0
2nd year	120	9·1
3rd year	130	8·3
4th year	140	7·7
5th year	150	7·1

These figures tell nothing about natural expansion, or how much is fairly to be credited to exertions in the selling department. If there is no natural expansion, each successive increment is a nearer approach to saturation point, reduces the as yet uncovered ground, and needs more intensive cultivation. The

increase at the end of the fifth year is therefore more creditable to the salesmen, although not greater in amount. Where gas cookers have not previously been let on hire, the salesmen have not much to do beyond booking orders, for the first year; after that they must hunt out those who need persuasion, which means more time and labour.

There is difficulty in accurately defining how much is due to natural expansion and catching-up of arrears, or to skill on the one hand and neglect on the other, among the staff; also as to permanent or only temporary character. Gains may be due to new customers, certain lines of appliances coming into fashion, novelties, abnormal but temporary demand, overtime in factories, and other local circumstances; and losses, to suchlike causes operating in the contrary direction. Some manufacturers start in a small way with a gas-engine as prime mover; but after a while the scale of operations increases to a degree that warrants installation of a boiler and steam engine. Many prepayment consumers, after the gas cooker is fixed in the kitchen, become accustomed to hot breakfast and supper, who formerly dispensed with such comforts as involving too much trouble. Gains may be directly traceable to selling campaign effort, exhibitions, demonstrations, advertisements, circulars, or personal solicitation. The selling department should follow-up anything that attracts public attention. A larger holder at the works, enlargements of mains, opening a new showroom, or improved public lighting, are sure to stimulate business. The user of 50,000 c.ft. during 1923 may be induced to consume 60,000 or 80,000 c.ft. in the course of 1924. The effects of prejudice, ignorance, discontent, and misrepresentation are not negligible, and can be remedied, or at least minimized.

The obligation to supply any applicant situated within a certain distance of a gas main, obligatory on statutory companies and generally accepted by others, attended with inadequate responsibility on the other side, is a relic of a state of things that no longer exists, and under post-war conditions is more onerous, both in respect to first outlay and annual expense, than is evident at first sight. It is largely responsible for the introduction of a class of consumers who are parasites on the undertaking. The same applies to special prices for special purposes without stipulation as to quantity of gas used, whereby the owner of a gas engine that is only required for one hour per week is placed on an equal footing with those who run ten hours every working day. If the expenditure per consumer is taken at only 10s. per annum, and the annual accounts show a net revenue of 25 p.ct. on gross sales, a minimum of £2 per annum is required to free each customer, and a user of £1 costs other parties £1 per annum. This point might be further laboured by reference to unaccounted-for gas. A large proportion of unprofitable consumers, and a large deficit between gas made and sold, run together.

From time to time there is a feeble protest, and demand for a minimum charge; and in the United States a somewhat elaborate system, starting with a fixed charge for "readiness to supply," followed by a price for gas based on a sliding-scale according to quantity consumed, has been adopted. But British undertakings prefer the risk of the unprofitable consumer to remedies that might turn out to be both troublesome and unwieldy. Attempts in the direction of equity are apt to be accepted as tending in another direction, unless simple and easily understandable—as witness statements that have been put forward about the therm by writers or speakers who ought to know better.

The 10 p.ct. increase of sales may be satisfactory as consistent with reasonable expectation, or disappointing because at least 15 p.ct. was looked for. It is an interesting fact in relation to the current dividend, but indicates little either for or against the general position, and may include any of the following conditions: A *bona fide* evenly distributed and all-round increase; a temporary increase on one branch only; or a 20 p.ct. increase in one direction, that covers a 10 p.ct. decrease in another. All these will be concerned to a greater or less extent, and only those officials who are in continual contact with the consumers in all parts of the district are in a position to unravel them efficiently. Hence the advantage of specially qualified salesmen, in preference to ne'er-do-wells from another department.

Before the sales increase is used as a basis for calculations relating to future operations, a few corrections should be made by an official having full acquaintance with local circumstances. There are large consumers whose requirements will vary considerably, one year against another. A railway company adjusts the times of trains periodically, and factories alter the hours of work. Attention is always given to economy of artificial light in this connection, and a slight alteration may mean much difference. A reduction of an hour a day in a large factory may bring down the consumption of gas to the extent of 30 or 40 p.ct. Some managements may be inclined to regard these refinements as superfluous, and, considering the extra trouble involved, prefer to accept the laws of average as a sufficient corrective for practical purposes, and consequently gloss-over important matters that might with advantage be revealed.

Seasonal and climatic variations cannot be avoided, but are none the less another heavy tax on the resources. The whole of the apparatus concerned, from retort to burner, must be equal to a maximum that only comes along once a year, and perhaps less frequently. Provision must be available against the requirements during a prolonged frost, but may not be called upon during a mild winter. The Sunday noon cooking demand is not in evidence at any other time during the week. Where cooking by gas is not in favour, or has never been encouraged, the chances are that business is conducted at a dead loss for not less than six months out of the twelve. The outlet main from a works supplying 30 million c.ft. of gas per annum is probably 12 in. in diameter. If on full duty for the whole of the 8760 hours comprised in a year, a run of half-a-mile in length would carry more like 300 millions, allowing a 1-in. pressure drop. A 1-in. service laid on to meet a demand for perhaps 60,000 c.ft. per annum would pass ten to twelve times this quantity under similar conditions. Subject to ordinary circumstances, a lighting burner in regular use is not wanted for nineteen or twenty hours out of the twenty-four, and many are only in occasional use for about one hour daily. The same applies to places of worship or amusement, public halls, gas cookers, fires, and stoves.

By far the greatest loss of all is lost opportunity. According to Shakespeare, fortune knocks once at every man's door, and this is sometimes read to mean that she does not knock twice, whereas anyone with extended knowledge of mundane affairs will admit that she has been known to knock twenty times or more. There is something paradoxical about a loss that never had a tangible existence, but such is none the less real. Small gas undertakings are to be met with that, for one reason or another, have never earned more than a 4 p.ct. dividend, when there is no earthly reason why they should not be made to pay 10 p.ct. When the responsible manager is cornered by comparison with similar concerns, he falls back on any explanation other than the correct one. Others are known to be so successfully put upon their feet that in the course of ten years all traces of previous incompetent management are wiped off the slate. Investigations into sales per consumer or head will unearth lost opportunities that have been passed as unavoidable, but are capable of disappearing before skill and enterprise. The manager of a works supplying a mining centre may conclude that there is no advantage in putting out cookers on hire terms, in view of the miner's free allowance of coal, regardless of the fact that hundreds of proofs to the contrary can be found throughout the country. Assumptions of this character should not be blindly accepted, but tested by reasonable skill, push, and enterprise. Difficulties are said to be created in order to be overcome.

The lines above instanced comprise a larger field open to the selling department than is available for the gas engineer, in the way of improved management or installation of new processes. Why does the average per consumer or per head vary so widely in districts of similar size and circumstances? A starting point is an intimate knowledge of prevalent local conditions during the past ten years, obtainable from the meter cards, and a list of appliances in use, if such information is not included, as it should be, on the cards. The rental books show only the appliances on hire, and ignore those belonging to the consumers. If an adequate number of the latter class does not exist, the sooner the deficiency is remedied the better. Hiring is so common that sometimes it overshadows direct selling. The sales department should remember that the first commandment is to act up to its name, and that hiring is only a substitute to be tried where direct selling fails.

Seasonal Storage of Coal.

The Federated American Engineering Societies appointed a Storage of Coal Committee, to inquire into the subject of seasonal storage to avoid shortage; and this Committee, in their report, recommend that all coal consumers should purchase their coal on an annual contract for yearly requirements, with a provision that the coal be delivered monthly in equal quantities. The Committee further recommend that consumers should provide necessary storage facilities to meet the terms of such contract. These recommendations are based upon the finding that the purchase of coal upon a uniform monthly delivery basis will result in a condition whereby: (1) Coal mines may inaugurate and maintain a regular production schedule; (2) carriers may plan definitely as regards both schedules and equipment for a uniform movement of coal; (3) stocks of coal will automatically accumulate during the months from April to September, inclusive, in sufficient amount to meet the extra consumption during the winter months; and (4) a reduction in the price of coal will be made possible by more regular schedules of production and transportation, and by elimination of peak demands in the winter months, when the costs of both production and transportation are highest. The Committee reiterate that the coal consumers through seasonally storing coal can, and should, initiate this vitally necessary cycle of changes.

Wales and Monmouthshire District Institution of Gas Engineers and Managers.—The next meeting of the Institution will be held on Nov. 19 at Swansea, when the President-Elect, Mr. W. H. Johns, will deliver his address. Afterwards, the Chairman and Directors of the Swansea Gas Light Company will entertain the members and other visitors to luncheon, and in the afternoon the Company's new works at Morriston will be formally opened.

American Gas Association.—The full programme which is now available of next month's convention and exhibition of the American Gas Association gives promise of a busy, profitable, and pleasant time. The meeting place is to be the Steel Pier, Atlantic City (N.J.), and the time is from Monday, Oct. 13, to Friday, Oct. 17, inclusive. The expected attendance is from 3500 to 4000. Half-a-dozen separate sections will discuss the technical matters that are to be introduced.

GAS AND COKE MANUFACTURE.*

By A. GREBEL and H. BOURON.

AFTER briefly touching on historical points, the book commences with a general survey of solid and liquid fuels, their classification, composition, and physical properties, and of coal gas and its constituents. The matter relating to combustion and thermal problems is well written, and contains graphs and useful tabular information regarding heats of combustion, ignition, flame temperatures, rate of combustion, &c.

The manufacture of gas and coke proper occupies about half the volume, and begins with the questions of coal buying, sampling, and testing. The methods usually adopted for carrying out proximate analyses are given, but set down rather loosely, and not in great detail. Ultimate analysis is left out altogether, "as this is not carried out in the ordinary works laboratory." The authors recommend the buying of coal on a calorific value basis, using the proximate analysis also as a guide. "The gas-manager is essentially a trader in heat units." If a Mahler or other bomb calorimeter is not available, recourse is suggested to the Goutal formula for obtaining the calorific value from the proximate analysis. The figures so obtained, according to Mahler, are sufficiently accurate. With this dictum I heartily disagree. In discussing the reception, handling, and storing of coal, the telpher conveyor hardly receives the attention it deserves; the one illustration of coal handling plant given is that of a 30-ft. "Simplex" portable belt conveyor.

Carbonization is treated more fully, and interesting graphs and tables of carbonizing results are furnished. Lewes' work on tar and gas yields at different temperatures, and Cobb's theory regarding the destruction of paraffin bodies at high temperatures are quoted. Some attention is given to the production of low-temperature coke, and the yields of oil and gas at 600° C. The "Coalite" process at Barnsley is described and illustrated. The authors do not, however, predict a great future for the low-temperature carbonization of coal. Theoretical considerations regarding the heating of retorts and ovens are set out, and then follow diagrams and descriptions of the usual types of producers, both direct-fired and recuperative. A short general description of tar-fired and gas-fired producers is included.

The various carbonizing systems are then described, commencing with the Woodall-Duckham verticals, followed by the Glover-West. These continuous retort plants are illustrated, and sizes, &c., are appended, as is also the case with the Dessau and Picard systems. The diagrams (and subject matter) of solid-end retorts, built back to back, seem to us here strangely out of date; but it appears that in many of the smaller works in France these retorts are still in use. The space devoted to horizontal through-retort settings is meagre and insufficient, and inclined retorts are dealt with in the same way. The authors next pass on to describe shortly the "Ries" inclined chamber ovens (6-ton charge) and the Koppers horizontal chambers.

Then follows the section on the construction of settings, which is decidedly incomplete, much more space being devoted to calculations and data for the construction of chimneys. Air regulators on the primary and secondary air flues are recommended. The design of the Hudler-Glauchan regulator (p. 267) is similar in principle to that of T. Brooke, patented and used in England. The decarbonizing of retorts is explained briefly, and of interest is the diagram of the Farcot portable decarbonizer for solid-end retorts, consisting of an electrically-driven fan and telescopic tube for circulating air through the retort while "standing-off."

Retort-charging plant is next dealt with; the De Brouwer, Frère, Compagnie Parisienne, and Gennevilliers machines being described. For discharging, the Frère "scraper" for solid-end retorts and the De Brouwer and Sautter-Harlé "pushers" are set forth. Before concluding the chapter on gas-making apparatus, the Mertz coke-fired plant for making oil gas is mentioned.

The production of coke in coke ovens is described, and the various well-known systems are reviewed and illustrated—the Semet-Solvay, Otto, Coppée, and Lecocq. Both recuperative settings and ovens fired with low-grade gas are shown. The section ends with a discussion of the inter-relations of the coke and gas industries. Water-gas production is treated rather briefly; the Humphreys and Glasgow, Dellwik-Fleischer, and Rincker-Wolter plants being shown diagrammatically. Complete gasification of coal, the authors say, has not been a great success in England, Germany, France, Austria, or Holland.

Purification.—After some useful theoretical considerations (with tables) regarding condensation, the usual methods of taking off and cooling the gas are described, from the hydraulic main onwards. The Reutter type of water condenser, with ranges of horizontal cooling tubes, washed intermittently with ammonia liquor, is interesting. As regards tar extraction, the Pelouze and Audouin apparatus is illustrated, but the cyclone type is passed over as unsuccessful and almost useless. One would like to see more space devoted to exhausters and their construction, as the small section of a Beale exhauster given is insufficient. Turbine blowers find no place at all in the book; nor, strange to say, does the Livesey washer.

When dealing with rotary washers, the authors illustrate two, both of English make—the Holmes and the Kirkham. Centrifugals are dealt with briefly, the only illustration, that of the Kirkham, being misnamed the Feld. Then follow short descriptions of the various methods of extraction of cyanogen, naphthalene, and benzole, all too short to be of material value. Purification by oxide of iron is given the space it merits, both wet and dry purifiers being illustrated, and rotation working clearly explained.

The section on metering and storage of gas is well written, the Venturi and Pitôt tubes being explained, in addition to the usual station meter. This is necessary, as coke oven practice is included in the scope of the book. More information on spiral-guided holders and general holder construction could be added with advantage. The chapter on gas manufacture ends with a description of station governors and gauges and large gas-valves of various types.

The section on town gas is really a summary of the main facts relating to modern gas supply. After dealing with the testing and analytical control of the gas at the works (including such tests as illuminating power, calorific value, specific gravity, and sulphuretted hydrogen), the authors discuss at some length the various formulæ for discharge of low-pressure gas through mains. M. Grebel, one of the authors, gives his own formula and tables *in extenso*. The matter on main laying and jointing is rather scrappy; but the remainder of the section is a useful résumé of information on domestic gas supply for lighting and heating, furnace heating and metal melting, pressure distribution of gas over long distances, &c. The whole extensive field of gas supply is not covered, of course, but perhaps a better balance could be maintained in the usefulness of the information offered. For instance, some eight diagrams of a wet meter are given, but none of a dry meter, "as these are seldom, if ever, used in France." Again, while showing a section of an old ring burner, the more modern "Pleno" type would not be out of place. The tabular information in this chapter is useful.

The article on coke is interesting, and contains much regarding the commercial grading of coke in France. Screening, handling, and washing are explained briefly. Tabulated notes on cokes from gas-works and coke ovens, their differences and technical requirements, are given at length. The book concludes with a concise chapter on bye-products, and deals with the working-up of tar, ammonia, and benzole. M. Grebel sets out in diagrammatic form his own schemes for the manufacture of sulphate of ammonia and washed benzole. Administrative notes concerning the legal and commercial side of the gas industry are to be found at the end of the book.

Altogether the authors are to be congratulated on having produced a treatise on gas and coke manufacture of so concise and complete a nature that it must prove of immense value to the student of both gas engineering and gas supply. The field covered is very wide, but little has been left untouched. From an English point of view, some of the information might be considered as hardly up to date, and sufficient prominence is in many cases not given to the most modern large works' practice. Nevertheless, the volume compares favourably with any other treatise I know, and can therefore be recommended to "JOURNAL" readers.

W. B. DAVIDSON.

* "Gaz et Cokes," by A. Grebel and H. Bouron, pp. 700. Paris: Dunod; 1924. Price, 67.50 fr.

Caustic Soda Process of Extracting Low-Temperature Phenols.

Messrs. Morgan and Meighan, in a paper submitted to the American Chemical Society, pointed out that the application to low-temperature tars of the caustic soda process of extracting phenols requires the investigation of certain factors whose influence has never been clearly known, even in the case of high-temperature tars. A method involving the use of metallic sodium for measuring accurately the sodium hydroxide equivalent of phenols and tar oils has been devised. When applied to phenols, this determines their average formula weight. In the extraction of total phenols from low-temperature tar oils, it has been found that there is an optimum concentration of the aqueous caustic soda solution, at which extraction is complete with the chemically equivalent amount of sodium hydroxide. In the case of high-temperature tar oils, extraction of the phenols is complete with the chemical equivalent of all caustic soda solutions over a certain minimum concentration. When less than the chemical equivalent of caustic soda is used for the extraction of low-temperature phenols, the proportion of phenols extracted is greater than the proportion of caustic soda used. The average formula weight of the phenols extracted increases as more caustic soda up to the chemically equivalent amount is employed.

Radiation from Non-Luminous Flames.—From measurements of total and relative radiation from non-luminous flames of several gases, Messrs. Haslam, Lovell, and Hunneman have found that from 10 p.ct. to 15 p.ct. of the latent heat is dissipated as radiant energy. The amount of radiation, it is stated, decreases with excess air, and also with preheating of the mixture before combustion, and bears no simple relation to the composition of the gas, the products of combustion, or the flame temperature. The view is put forth that radiation from a flame is a matter intimately connected with the chemical reactions rather than with temperature, and that in the spectroscopic study of flame radiation there exists a powerful tool for the investigation of the mechanism of complex reactions.

CHEMICAL TOPICS FROM CURRENT LITERATURE.

By H. J. HAILSTONE.

COAL TESTING.

Messrs. Drakeley and Hepburn have made a study of coal analysis ("Transactions of the Society of Chemical Industry"), and in an endeavour to place on a mathematical basis the relation between volatile matter and ash contents of coal were able to develop formulæ for use in certain circumstances, though as a whole the problem did not admit of mathematical treatment owing to varying proportions of the different coal constituents. A later communication bearing upon the specific gravity of coal indicates that this factor also is independent of the ash contents.

Messrs. Webster and Wiggington, writing in "Fuel," state that the amount of volatile matter evolved in coal analyses is not affected by addition of sand, &c.—a view opposed to that arrived at by Messrs. Sinnatt and Grounds, and recorded in the bulletins of the Lancashire and Cheshire Coal Research Association.

BENZOLE RECOVERY.

A process is described by B. Neumann in "Chemisches Zentralblatt" for benzole recovery in which the plant is worked under reduced pressure. The benzolized wash oil completely gives off its benzole without contamination with oil and naphthalene. Owing to the consequent working at lower temperatures, less polymerization occurs, and the wash oil may be retained in service for longer periods.

The use of silica gel and other refining agents in benzole manufacture has previously been referred to in these notes, and to the list of materials of this nature must be added bauxite, a compound silicate of alumina. A long account of the application of this product to petroleum refining practice has been given by Messrs. Dunston, Thole, and Remfry, before the London Section of the Society of Chemical Industry, and much of the information is of interest to benzole refiners. The substance, after roasting, has been used for decolorizing, reducing the sulphur content, and for decomposing and polymerizing unsaturated hydrocarbons. It may be repeatedly used after roasting, which renews its activity.

STEAM PIPE INSULATION.

Useful information for calculating heat losses, and the consequent financial losses, from bare and insulated steam pipes is given in "Industrial and Engineering Chemistry," by R. H. Heilman. By means of formulæ, the losses may be calculated from the steam and air temperatures and the size of pipe and its covering. Much useful data of this kind appear in the recently issued booklet of Messrs. Hobdell, Way, & Co., of London, and this will well repay careful perusal by those whose work includes steam production and economy, and who contemplate carrying out steam pipe lagging work. One of the best of the short reviews of the practical side of this question was written some time ago by Mr. A. Grounds for the Engineering column of "The Manchester Guardian," and, as will be seen from the following quotation, this deals in a very clear manner with general considerations—

> The ideal lagging should have a low specific gravity, specific heat, and thermal conductivity, and sufficient mechanical strength to withstand accidental blows. It should also be capable of withstanding the dripping effect of water and condensed steam leakage without disintegration, and should not possess a high coefficient of expansion or contraction. Alternate wetting and drying should not render it useless, and it should not be liable to combustion at a temperature 100° Fahr. above that usually obtaining in the pipe. It should not have any chemical or mechanical action on the surface to which it is applied, and it should not be of such a nature that it will harbour vermin.

Such are the desired qualities, and the means by which some of these may be obtained are described, together with the various methods of application. The fallacy of choosing a particular lagging because of its low price is emphasized.

FIRE EXTINGUISHING.

In "Industrial and Engineering Chemistry," C. K. Swift refers to a subject of which little has been reported in the Technical Gas Press, and which is deserving of greater attention in gas and tar works control. The application of foams for blanketing the surfaces of burning oils and liquids in order to extinguish flame has come to be the recognized practice in fighting works fires of this character, owing to the ease, speed, and certainty of operation. The "Foamite" system belongs to this type. Foam-producing solutions consist of mixtures for forming bubbles of carbon dioxide in a chemically inert medium, and the presence of saponaceous materials ensures greater strength and permanence to these bubbles. The foam must flow readily, and not be broken down too rapidly by heat. In general practice one solution consists of a carbonate or bicarbonate, together with a quantity of a suitable glucoside or other saponaceous substance. The other reacting solution comprises an acid or acid salt with or without the addition of an aluminium salt. The paper referred to deals with laboratory methods to be used in the examination of foams of this class for their strength and lasting qualities. In these trials, a pan of petrol is fired, and a small volume of the foam (not enough to extinguish the flame entirely) is poured upon the surface. The time taken to break-down completely the area of foam gives an idea of its stability under practical conditions. Methods for determining spreading power and other useful factors are also described. There is another interesting field in which foams might be of great use—and it is surprising that a suitable mixture has not yet been put on the market—for floating over the surface of ammonia liquor in open tanks. There are disadvantages in using a layer of oil which might be obviated by the substitution of some harmless mixture of the kind indicated.

LEATHER BELTING.

A standard specification for leather belting published and issued free by the Federation of Leather Belting Manufacturers of the United Kingdom, and obtainable from No. 1, Booth Street, Manchester, should be filed by users of belting. A minimum standard of quality is described, and affords a useful basis upon which purchases should be made. The conditions under which belting has to operate in the average gas-works are none too good, and belts are frequently expected to function satisfactorily in an atmosphere of moisture or dust. No belt—leather, cotton, or hair—can be expected to remain suitable for indefinite periods under conditions of this kind, and the Federation of Belting Manufacturers would render the gas industry further service by issuing standard specifications for dressings to be employed for prolonging the life of belts engaged in such circumstances.

LABORATORY APPARATUS.

K. Albert describes in the "Chemiker Zeitung" a simple type of viscosimeter designed for use with resin solutions. This appears to be eminently suited to work on tars. It consists of a brass ball hung on a fine wire, and partially counterpoised by means of a pulley and weight. The rate of fall of the ball through the liquid under test may be measured by the equivalent rise of the balance weight, which may be varied to suit the substance tested. The instrument is calibrated by trial observations with oils of known viscosity.

A method of employing a microscope in the determination of the refractive indices of liquids is given by C. Kiplinger in the "Journal of the Chemical Society," and this may be usefully employed in the gas-works laboratory for the examination of oils, solutions, and organic liquids. A small glass bead is supported on the glass slide on the microscope slide, and the instrument focussed through this upon a distant object. When a drop of liquid is placed on the slide in contact with the bead, the system is thrown out of focus in proportion to the refractive index of the liquid. Thus, by noting the degree of adjustment necessary, a measure of the refractivity is obtained, and can be worked out after preliminary examination of known liquids. The results are accurate to the second decimal place, and will therefore serve for general identification and control work.

The device of R. Brooks ("Journal of the Chemical Society") is suitable for maintaining the level of water baths. Water from the tap or condenser is run through the top limb of a glass cross tube supported over the water bath, and discharges through a slide arm and rubber tube down to the sink. To the other side arm is fitted a glass tube reaching down to the desired water level of the bath. The bottom limb is provided with a jet and screw clip adjusted to provide a continuous feed to the bath. In operation water runs to the bath till the proper level is reached, and any surplus is removed by automatic syphoning through the side tube and down to the sink.

ANALYSIS.

The rapid absorption of ethylene by aqueous solutions of silver nitrate and phosphoric acid is mentioned by W. Lommel and R. Engelhardt in the "Berichte" as being of service in gas analysis methods, and from the solutions the ethylene may be recovered by evacuation. Work by W. Gluud and G. Schneider has shown that the presence of silver salts is also advantageous in the absorption of ethylene by sulphuric acid, as it not only enables strong solutions to be obtained, but also accelerates the absorption. Other metallic sulphates are stated to behave in a similar manner, though to a less marked degree.

The "Comptes Rendus" records a description by A. Damiens of a reagent suitable for the absorption of carbon monoxide, and in the absence of oxygen and unsaturated hydrocarbons this may be used in determinations. To prepare this reagent, ethylene is passed into a solution of cuprous sulphate in sulphuric acid, and thereby yields an addition compound $Cu_2SO_4 . C_2H_4$, which is employed as a suspension in sulphuric acid.

The work of W. M. Cumming, described in the "Journal of the Chemical Society," has led to a simple method of estimating sodium, potassium, and calcium ferrocyanides based upon precipitation from cold neutral solutions with excess of benzidene hydrochloride. The white precipitate of benzidene ferrocyanide is filtered off, washed, and dried, and ignited to yield ferric oxide, from the amount of which can be calculated the percentage of ferrocyanide. A volumetric method based upon the same principles has also been worked out, and consists of titrating the neutral solution with a standard solution of the benzidene salt. The best indicator was found to be a solution of bromine water just decolorized by the addition of sodium carbonate. This is used externally on a filter paper.

CAST IRON.

The gas industry has always been a large user of cast iron in structural work, furnace and plant construction, distribution, and in the various engines and pumping installations, not to mention the big amount employed for burner and stove appliances. Hence

the quarterly bulletins issued by the Cast Iron Research Association should be of interest and value to most "JOURNAL" readers. The June issue contains a number of important announcements regarding the general policy of the Association, some of which have already been dealt with elsewhere in the "JOURNAL." Among other items appears a review on rustless cast irons and surface treatments, and an excellent bibliography of the subject—of importance to gas and appliance manufacturers. A list indicating the scope of the researches being undertaken by the Association in their own and in allied laboratories includes many items that will be of service to the gas industry, which should in due course derive many benefits from the activities of this rapidly developing organization. In a recent lecture before the Empire Metallurgical Congress, the Association's Director, Mr. J. G. Pearce, stated that "the business of the foundry industry is to secure such knowledge of the constitution, properties, and modes of manufacture of cast iron that the material can be utilized as fully as its inherent possibilities and cheapness permit." This, with the substitution of "gas" for "foundry" and "cast iron," would appear also to define aptly the aims of the manufacturing side of our own industry. Makers of gas stoves, furnaces, and appliances involving castings of all kinds may be strongly recommended to join this Association, as in return for a small annual subscription the benefits of an expenditure of over £6000 per annum may be realized.

CORROSION.

At the recent annual meeting of the Society of Chemical Industry, Prince Conti gave an account of his renowned chemical engineering accomplishment at Larderello. One point of more than passing interest was the reference to the extensive use of aluminium to replace iron and copper in certain portions of the plant where corrosion due more particularly to sulphuretted hydrogen was encountered. This observation brings to mind the slight degree to which this metal and its alloys have as yet entered into gas-works practice, partly owing to the factor of high cost, and no doubt also to the deleterious effect of alkalies. Extended knowledge of these alloys will no doubt lead to their greater application in chemical industries generally.

SULPHATE DRYING.

A valuable contribution to the study of drying operations was made by Prof. Hinchley and G. W. Himus before a recent meeting of the Institution of Chemical Engineers. It deals with the effect of a current of air upon the rate of evaporation of water below its boiling point. This subject has a direct bearing upon one of the newer problems with which we have been faced—namely, the drying of neutral sulphate of ammonia. It is demonstrated by the experimental results (a report of which has since appeared in the official organ of the Institution) that the current of air is a governing factor in economical drying operations. This is a feature of sulphate drying upon which I have previously laid stress (see "JOURNAL" for April 9 last, p. 103), but it does not appear to be sufficiently recognized by all makers of drying apparatus. Controllers of sulphate plants using centrifugals will, if having a mathematical bent, find interest in another paper submitted at the same meeting by E. A. Alliott, dealing with the various phenomena exhibited by self-balancing centrifugal machines.

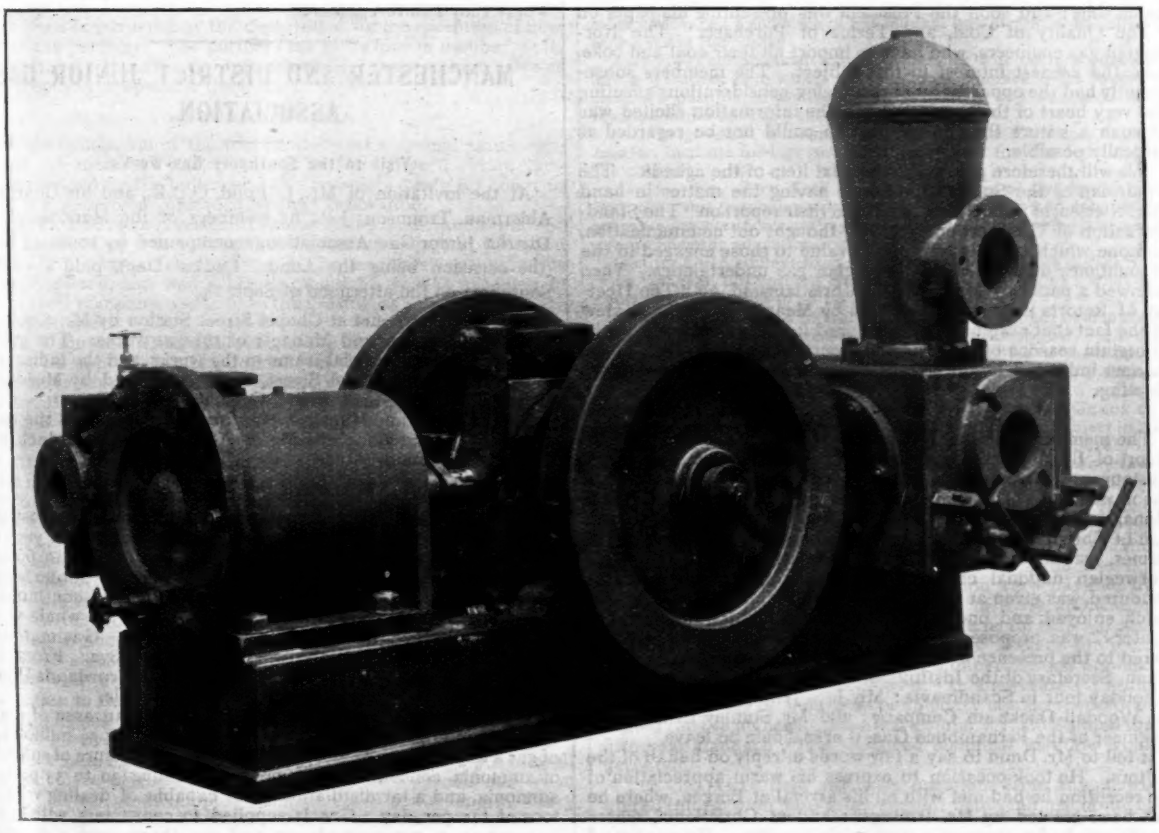
A "RELIABLE" SERVANT.

A Tar Pump with Half-a-Century's Service, and Still Running.

The illustration shows a "Reliable" steam-driven tar pump of the well-known type manufactured by Messrs. Joseph Evans and Sons (Wolverhampton), Ltd.

The pump in question has a 14-in. diameter steam cylinder, an 8-in. diameter pump, a 12-in. stroke, and was supplied fifty years ago to the Birmingham Corporation Gas Department. As showing the excellence of the workmanship, material, and general construction, the pump, after being in use for this number of years, has just been to the makers' works for repairing and overhauling, and the photograph was taken after the repairs were carried out.

Messrs. Joseph Evans and Sons, Ltd., are supplying this type of pump to gas-works, tar distilleries, coke-ovens, &c., for the home market and export in larger numbers than ever, thus proving that the "Reliable" steam pump is as popular as it was fifty years ago.



Critical Oxidation Temperature for Coal.—According to Messrs. S. W. Parr and C. C. Coons, on "Carbon Dioxide as an Index of the Critical Oxidation Temperature for Coal in Storage," the discharge of carbon dioxide from coal subjected to a current of oxygen and maintained at varying temperatures has been studied, and an apparatus described for its measurement. The facts brought out in the investigation of various coals by use of the device are helpful in that the degree of chemical activity of oxygen at various temperatures is readily shown. Specially important is the point indicated at which the temperature due to oxidation within the coal passes the temperature of the surrounding air. From this point the oxidation becomes autogenous. This is designated the critical oxidation temperature, and in a coal pile would be practically synonymous with the temperature of ignition. This critical temperature varies, but its chief significance is its relatively low range for most coals, approximating 140° to 150°.

NORWEGIAN ASSOCIATION OF GAS ENGINEERS.

By our Special Correspondent.

As Norway possesses only about twenty gas-works, the Norwegian Association of Gas Engineers is necessarily numerically small, but it is very virile.

Possibly the first town which most Britishers enter in Norway is Bergen. Well-equipped steamers flying the Norwegian flag run from Newcastle. It was the "*Jupiter*" which our Special Correspondent boarded on Thursday afternoon, and which, after a very pleasant voyage in good company, made the port of Bergen punctually at advertised time—9.30 on the evening of the following day.

The gas-works of the town of Bergen are managed by Mr. John Irminger, son of the well-known Engineer of Copenhagen (now retired), who designed the Valby Gas-Works there. The name of this veteran Engineer will, however, go down to posterity more by reason of his having, after much painstaking study and labour, established laws governing the problem of wind pressure on roofs and other structures. Previously they were built on quite erroneous hypotheses. Their application to gasholder construction is, of course, of great importance; but now that the design and construction of aeroplanes has come so much to the front owing to the war, the work of Mr. Irminger has really become of international importance. His formulæ have been adopted by all the countries where aeroplanes are produced. But this is by the way, though of interest to the British Institution of Gas Engineers on account of Mr. Irminger's membership.

The Norwegian Association met at Christiania on Thursday, Aug. 28, under the presidency of Mr. T. Neuman, who occupies the post of Chief Engineer to the Gas-Works of Trondhjem. From Jan. 1 next year, Christiania is to be known throughout the world by its original name of Oslo. Such are the ways of Socialist majorities in the Norwegian Storthing. The meeting was held in the premises of the Institution of Engineers, situated near the Royal Palace, on Thursday and Friday, Aug. 28 and 29, and was fairly well attended. It is of interest to note that Mr. Neuman is the son of the late Mr. Neuman who took charge of the Bergen Gas-Works after its completion.

Papers Read.

The opening proceedings on Thursday morning did not require much time; and soon the President was presenting his paper on "The Quality of Coal, and Terms of Purchase." The Norwegian gas engineers, who have to import all their coal and coke, take the keenest interest in this subject. The members subsequently had the opportunity of discussing considerations affecting the very heart of their operations. The information elicited was of such a nature that its publication could not be regarded as ethically possible.

We will therefore pass on to the next item of the agenda. The Chairman of the Special Committee having the matter in hand (Mr. Nielsen, of Sandefjord) presented their report on "The Standardization of Gas Accounts," a well-thought out communication, and one which is likely to prove of value to those engaged in the accountancy department of Norwegian gas undertakings. Then followed a paper by Mr. Holth, of Christiansund, on "The Heating of Retorts in Small Gas-Works by Means of Gas." In view of the fact that surplus gas is produced in Norway at some works at certain seasons of the year, the description of utilization in the manner indicated by the title of the paper greatly interested the meeting.

Luncheon.

The members then made their way to the well-known pleasure resort of Bygdö in the environs of Christiania, where, in Olsen's Restaurant at Dronningen, in the Royal Yacht Club House, luncheon was laid. The chair was taken by Mr. Horn, the General Manager of the Gas and Electricity Undertakings of the Corporation of Christiania; and Mr. J. G. Tooms, Chief Engineer of the former, was in the vice-chair. The repast, with its interesting Norwegian national characteristics and observances all duly honoured, was given at the invitation of the Corporation. It was much enjoyed, and one or two short speeches followed. "The Visitors" was proposed in genial terms by Mr. Tooms, who referred to the presence with them of three Englishmen—Mr. W. T. Dunn, Secretary of the Institution of Gas Engineers, who was on a holiday tour in Scandinavia; Mr. J. S. Jeffrey, on business for the Woodall-Duckham Company; and Mr. Stanley E. Logsdon, Engineer of the Pernambuco Gas-Works, home on leave.

It fell to Mr. Dunn to say a few words in reply on behalf of the visitors. He took occasion to express his warm appreciation of the reception he had met with on his arrival at Bergen, where he had been greeted by Mr. Irminger; and at Christiania, where Mr. Tooms had performed a similar kindly office. He was proud to know that both these gentlemen, members of the Institution, were doing such excellent work in Norway. He had heard their high accomplishments as gas engineers spoken of by various officials of gas and electricity works with whom he had come in contact since his arrival in their country. In conclusion, he gave the toast of "Continued and Increasing Prosperity to the Norwegian Association of Gas Engineers." The gathering broke up with some remarks from the President, and the remainder of the afternoon was spent in sightseeing. The famous Norwegian National Museum close by, in a wooded park several acres in extent, was available for visiting. Here are to be seen various examples of ecclesiastical art and craftsmanship from the middle of the sixteenth century to about the middle of the eighteenth.

Further Business.

On the following day an excellently written paper by Mr. Irminger, of Bergen, was read by him. It contained a good deal of really valuable information, and must certainly have achieved its object in acting as a stimulant to some of the members who the author apparently fears are giving way to despair when confronted with the handicap which gas has placed upon it through the abundance of water power—white coal—in Norway. The principal points in the paper are: High prices of coal and coke. Gas is the best fuel for industrial purposes, owing to its reliability, cleanliness, and ease and precision with which temperatures can be regulated. There is a great saving on coal consumed. It is of vital importance that the world's coal and oil supplies should be conserved. Especially the latter, when it is remembered that oil is practically the only base for the manufacture of lubricants for engines, &c. In Great Britain, but a few years ago there was an over-production of coke, with a consequent fall in prices; now there is evidence that the demand for coke would soon exceed the supply, and improved prices from the gas engineer's point of view will prevail. At the present time, English coal from the Durham fields costs, delivered at Bergen, 22s. 6d. per ton, and coke 32s. to 35s. per ton. Coke is so much required in Norway for domestic heating purposes, &c., that it would be economically sound to keep the gas-works running to manufacture coke, and let the gas go to waste. The value of waste-heat boilers is fully recognized in Norway. They are in use at Bergen, Christiania, and other places.

The author devoted a considerable part of his paper to questions arising from the competition between gas and electricity. While admitting that the latter form of power was undeniably superior for traction, and such purposes, there still remained a very wide field for the use of gas. In certain cases, hydro-electricity control stations had been built of too great a capacity, at an enormous cost, so that, instead of the expected blessing which the supply of electric energy was supposed to bring, it had proved a curse. Money had to be found to pay interest on the heavy capital charges involved, and the community suffered in consequence.

The members dispersed to their several homes in the afternoon—some great distances away from the fair city of Christiania where they had foregathered.

MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.

Visit to the Southport Gas-Works.

At the invitation of Mr. J. Bond, O.B.E., and his Chairman, Alderman Trounson, J.P., 63 members of the Manchester and District Junior Gas Association, accompanied by some 40 ladies (the occasion being the Annual Ladies' Day), paid a visit to Southport on the afternoon of Sept. 13.

The party were met at Chapel Street Station by Mr. Cook, the Assistant Engineer and Manager of the gas-works. The gentlemen proceeded by special trams to the works, and the ladies went to see the shops in Lord Street, being conducted by Mesdames Bond, Trounson, Stone, Dixon, Cook, and Halsall.

The Engineer and Manager, Mr. John Bond, received the party at the works, and along with Messrs. Cook, Halsall, and Jack, conducted them round.

Description of the Works.

In 1850, the Southport Corporation built gas-works in Eastbank Street, at a capital expenditure of £3528. During that year the make of gas was 578,000 c.ft., and the quantity sold to 69 consumers amounted to 295,000 c.ft. There were 79 public lamps, which consumed 230,700 c.ft. of gas. Gas-making continued at Eastbank Street until June 20, 1878, after which the whole of the gas was manufactured at the Crowlands Works. Gas manufacture commenced at the latter works on July 16, 1872. From that date to 1878, both the Eastbank Street and the Crowlands Works supplied the consumers of Southport and Birkdale.

At present the Corporation Gas Estate has an area of about 20 acres, and the gas plant is capable of producing 3½ million c.ft. of gas a day. There is also plant for the manufacture of sulphate of ammonia, concentrated ammonia containing 30 to 35 p.ct. of ammonia, and a tar distillation plant capable of dealing with 50 tons of tar per day. Gas is supplied to consumers within the borough at 3s. per 1000 c.ft., or 7·2d. per therm, with a discount of 5 p.ct. if the account is paid within one month from the end of each quarter. Special prices are charged for gas for power and commercial purposes in Southport. The make of gas for the year ended March 31 last amounted to 704,611,000 c.ft., and the quantity sold for cooking, lighting, heating, and power purposes (including street lighting) was 662,528,900 c.ft. The total capital expended to March 31 last amounted to £340,040, and the amount outstanding was £157,124.

Retort Houses.—The horizontal retort-house plant consists of a bench of fifteen beds of retorts. In each bed are set eight retorts

in three tiers, 20 ft. long, Ω section, 22 in. by 16 in. The settings are on the regenerative principle, and a number are fitted with step grates. The vertical retort-house consists of five settings of Glover-West retorts, each containing eight retorts. The gas made from these retorts mixes with that from the horizontal retorts at the foul main, being separately governed.

Coal and Coke Machinery (Vertical Retorts).—The coal elevator, coke conveyor, and coke elevator are driven by means of gas engines, which are suitably housed. An electric telpher plant removes all the coke made, and distributes it to the boilers, carburetted water gas plant, railway wagons, and coke hoppers.

Carburetted Water Gas.—There are three complete sets of Humphreys and Glasgow's carburetted water gas apparatus.

Engine House.—The engine house is 50 ft. square. In this are installed two exhausters and two steam turbine blowers used in connection with the carburetted water gas, three coal gas exhausters and engines, and two gas engines and dynamos for generating electricity for the use of stoking machine, telpher, elevator, and lighting.

Laboratories.—There is a calorimeter room, chemical and physical laboratory, and complete coal gas testing plant. The laboratories are fitted for the testing of all materials employed in connection with the works, also for the testing of gas, bye-products, fires, cookers, &c. At Eastbank Street rooms are fitted for the repairing and cleaning of stoves, meters, lamps, &c., and at the showroom there are exhibited appliances for cooking, lighting, &c., the uses of which are demonstrated to the public.

Street Lighting.—The greater portion of the streets is lighted by incandescent gas lamps. The number of lamps on the district is 3000, of which 600 are fitted with controllers.

Extensions to Works.

Ferro-Concrete Coke Bunker.—At present under construction is a ferro-concrete bunker capable of holding 450 tons of coke. The aggregate used for mixing with the cement is waste material—old retorts and brickbats. In the construction of the hopper, 230 cub. yards of concrete and 330 tons of material will be used, also 18 tons of steel bars of varying sizes will be embedded in the concrete for tying-in and strengthening the structure. The bunker will be divided into five compartments, each being fitted with shoots for loading into wagons on one side, and into carts or bags on the other. Screens are incorporated in the shoots. Breeze hoppers are to be fixed under the coke screens, and will be emptied as required into carts down a fixed shoot.

Water Gas Purifiers.—Foundations and a ferro-concrete raft have been constructed by the department for the reception of new water gas purifiers. The purifiers are to be four in number, 35 ft. by 25 ft. by 6 ft. on the dry lute principle. One common valve of the Wecks type operates the boxes.

Votes of Thanks.

At the conclusion of the tour of the works, special trams conveyed the members to Boot's Café in Lord Street. Here they were rejoined by the ladies, and the complete party sat down to high tea, generously provided by the Corporation.

Mr. H. E. Stone (President) welcomed the ladies, and remarked that Ladies' Day was a recent innovation inaugurated by Mr. and Mrs. Dixon some three years ago. The movement seemed to be going forward, and was evidently popular. It was excellent to have their company, and to have the meeting at an attractive place like Southport.

Mr. J. Bridge (Elland) moved a vote of thanks, and said how highly he appreciated the honour. It would be the wish of all present to express personally (if that was possible) their thanks to Mr. Bond, Alderman Trounson, his lady, and the members of the Gas Committee for the kindness shown to them that afternoon. It was about five years since the Association last visited Southport, and they welcomed the privilege of coming again. He also mentioned the interest Mr. Bond had always shown to the juniors, and the very valuable research work he had done on behalf of the gas industry.

Mr. J. Alsop (Bolton) seconded the vote. The arrangements for Ladies' Day, he said, had been left largely in his hands, and when he wrote Mr. Cook as to the possibilities of Southport he was astonished at the reply he received, which was an invitation from Mr. Bond for them to visit Southport. They had intended coming to Southport on their own, so that the spontaneous invitation was all the more welcome. Ladies' Day was now an established and desirable annual event. He concluded by calling attention to the great work done by Mr. Bond, and congratulated the Chairman of the undertaking upon having such an Engineer to preside over the works.

Alderman Trounson, J.P., in reply, said he always put himself in the place of the listener when he made a speech, and by so doing he was never tempted to make one of undue length. They were proud of their Engineer, and his relationship with all concerned in the department was of a very high order. Mr. Bond was always ready to assist the young man in his profession. He would like to impress upon the younger men present the desirability of making themselves thoroughly efficient, as it was the highly-trained scientific men who were wanted.

Personal.—Mr. J. Powell Thompson, Assistant Gas Manager to the Barnoldswick District Council, has been appointed to a similar position with the Colne Corporation.

INSTITUTION EDUCATION SCHEME.

Meeting in Birmingham.

A meeting of the staff of the City of Birmingham Gas Department was held in the reading room at the Council House on Friday evening, Sept. 5, with Mr. A. W. Smith (General Manager and Secretary) in the chair. A good number of the officials of the Department and members of the staff were in attendance. The meeting was also well supported by members of the Midland Junior Gas Association from Birmingham and the Midlands. Mr. Walter Hole, the Organizing Secretary of the Institution of Gas Engineers Education Scheme, had been invited to give an explanation of this; and the object of the meeting was to furnish an opportunity to the members of the staff and the Midland Junior Gas Association to put forward any question on which they desired information.

The Chairman generally outlined the scheme from the point of view of the Birmingham Gas Department, and hoped that there would be a good number of entries for the various examinations from the staff. The Gas Committee were most anxious that junior members of the staff should do all they could to improve their knowledge of the industry they were serving, and so qualify themselves for higher positions.

Mr. Hole thanked the meeting for the interest shown by the large attendance, and generally explained the scheme in both its sections. He mentioned particularly the arrangements which had been made to cover the transition period from the old examinations under the City and Guilds of London Institute to the new Institution Scheme. He had received a number of written questions, to which he proceeded to reply. These are set out as follows:

Question 1.—Can any definition be given as to the necessary qualification of a student before he can sit for the diploma?

Answer.—For a diploma in either subject, the higher certificate of the Institution in that subject, and the ordinary certificate in the sister subject, Gas Engineering or Gas Supply, must have been obtained, and the ancillary subjects which would be included in the examination must not fall below the standard of the higher certificate, but should represent a substantial advance.

Question 2.—Will the local technical school authorities be able to advise a student as to which year he may commence his course? In other words, can a schedule of educational qualifications be set up for each year in the course?

Answer.—The technical school authorities will be in a position to advise a student as to which year he must commence his course, the student's position, of course, being subject to the standards he has reached in the ancillary subjects.

Question 3.—Will a second-class pass in the City and Guilds of London Institute for last year qualify a student for the fourth year of the course?

Answer.—No. Mr. Hole here quoted a case of five students who had taken this particular examination last year and had only obtained second-class certificates, thus necessitating their taking the subject again under the education scheme.

Question 4.—A student has a first-class final certificate in Gas Supply from last year, but nothing as regards Gas Engineering; what is his course for qualifying to sit for the diploma?

Answer.—A first-class certificate in the ordinary grade course must be obtained in the sister subject. In this connection, Mr. Hole stated that at the last meeting of the Advisory Committee of the Education Scheme, a valuable concession had been made enabling a student to sit for the diploma examination providing that he held a City and Guilds first-class certificate in the final grade City and Guilds or the higher certificate under the Institution's scheme in the subject in which he desired to obtain the diploma, and a first-class certificate in the ordinary grade of the sister subject—provided, of course, that the student had reached the required standard in the ancillary subjects.

In the course of other questions, Mr. Hole stated that there was no age limit upwards for anyone desiring to take the various courses. The Advisory Committee insisted on attendance at technical colleges wherever this was possible, and where these courses were taken no fees for examination were payable by the student to the Institution. The object of early application for examination under Section II. of the scheme for external students was to enable the Advisory Committee to arrange for technical classes to be held where a sufficient number of such applications were received from any one district. In answering a question on what certificates or standards in ancillary subjects would be accepted for the higher examination course, Mr. Hole stated that the fifth year standard of an approved technical institute would be accepted.

The Chairman then asked for questions from anyone who required information, and those present made full use of the opportunity.

Mr. R. G. Marsh (Fittings Engineer to the Birmingham Gas Department, and also teacher in Gas Supply at the Birmingham Municipal Technical School) stated that the Technical School authorities were arranging for Wednesday and Thursday, the 17th and 18th inst., to be set apart for students desiring to take these courses to obtain all the information necessary.

The Chairman proposed a vote of thanks to Mr. Hole for attending the meeting, and for the concise way in which he had dealt with the large number of questions.

Mr. R. J. Rogers (Chief Superintendent, Fittings Department,

Birmingham), seconded the vote, which was supported by Mr. G. C. PEARSON (Engineer, Windsor Street Gas-Works).

Mr. HOLE, in reply, emphasized the necessity for the Institution Education Scheme, and stated that young men of the industry needed to look forward to the standards which would be operating, not in the years 1924 and 1925, but ten years ahead, when standards would be very much higher.

TECHNICAL NOTES FROM THE SOCIÉTÉ TECHNIQUE MEETING.

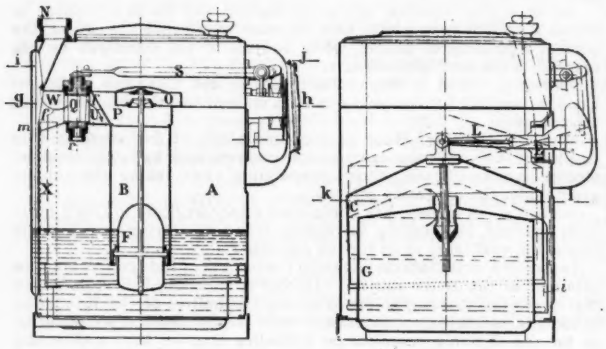
[From "Le Génie Civil," July 19.]

(*Continued from p.* 822.)

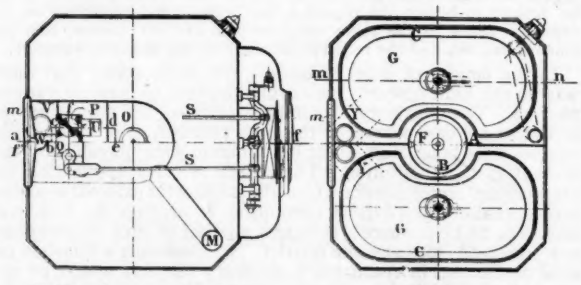
THE SIGMA METER.

M. G. Chamon introduced this paper with a few general remarks on the wet and the dry meter. The accuracy of the former category, he said, is unquestionable; but the presence of water brings forward several disadvantages. Briefly, these are the possibility of freezing; evaporation, necessitating frequent watering; troublesome condensation in service pipes; and corrosion through electrolysis. He questions the precision of the dry meter, as the volume measured by the leather bellows cannot be absolutely constant. Further, the inclusion of slide or other valves means a certain amount of friction; and lubrication of the moving parts is nowadays more difficult owing to the removal of the benzole from town gas and to the admixture of water gas.

The very first gas-meter (of Clegg, 1815) comprised two measuring bells; and in the new meter, which has been accepted for registration by the Paris Authority, the measuring means is constituted by one or several metal bells open at the bottom and partially immersed in mineral oil. Referring to the drawing, it will be seen that the meter case is divided into two by the vertical partition which is cut away to accommodate the well B over the float F. In each compartment rises or falls a bell C which is connected to the mechanism by a lever L; the isolation of the meter body from the mechanism being effected by a leather diaphragm E. Each bell C surrounds a box G, into which the gas flows from the distributor Q, and which keeps the oil bath within narrow limits. There is a distributor Q at the top of each compartment, worked by the measuring mechanism through a connecting rod S.



Section on *a b c d e f*. Section on *m n*.



Half-sections on *g h* and *i j*. Section on *k l*.

The Sigma Meter.

The gas arrives through the pipe M and enters the box O and passes through a valve which is held open by the float G to the distributing box P where it reaches the distributor Q. The drawing shows one of the butterfly valves passing the gas through the passage U (arrow *f*). Pressure is thus brought to bear on one bell; and the latter is forced down and clears out the gas it enclosed through the duct Y and X, in the box V, whence the gas is passed by the distributor into outlet N through W and *m*. The setting of the other butterfly distributor is such that, while the foregoing cycle is in operation, it leads the gas under the other bell through the anti-chamber V and the duct. This bell, raised by the gas, forces the gas enclosed above it through U to the distributor, and so on through W and *m* to the outlet N. The reversal of a butterfly valve takes place rapidly at the precise moment when the corresponding bell completes its movement in one direction or the other. For each bell there exist two dead centres; but these are overcome by the fact that the levers are cranked at 90°, and consequently the other bell is at the critical points receiving the maximum of gas.

The volume of gas measured by each bell is obviously that enclosed between its highest and lowest positions; and so the measured volume is strictly invariable and independent of the level of the oil or of the apparatus being out of plumb. The loss of pressure is less than either wet or dry meters—being somewhere near 1·5 mm. on a normal working. For equal capacities, the Sigma meter takes up 45 p.ct. less room than a Duplex wet meter and 55 p.ct. less than a dry meter.

COKE-OVEN GAS.

M. Boutefoy mentioned that the chief difficulties met in the distribution of coke-oven gas for town purposes were concerned with the quality and the purity of the gas, as well as the regularity of the daily output. As for the selling price of coke oven gas, one cannot obtain from coke-oven works a cubic metre of gas for very much less than the price of a kilogramme of coal; and the gas company must add to the price asked by the coke-oven works capital and upkeep charges on their own plant which is laid aside, and also the proportion of wages paid to the personnel which must be retained in case of sudden call upon it. It is only if the total thus arrived at is less than the cost to the company of gas into the holder that the matter is worth consideration. In the discussion which ensued, much stress was laid on the fact that gas companies making bulk purchases from coke ovens should obtain guarantees of calorific power, inert content, and purification of the coke-oven gas from sulphuretted hydrogen and naphthalene.

HISTORY AND PROGRESS OF GAS DISTRIBUTION IN PARIS.

Paris is of compact form and divided into two unequal parts by the Seine, the southern part forming barely three tenths of the whole. M. Leprince-Ringuet pointed out that before 1859 the limits of Paris were marked actually by the exterior boulevards. Its area was at that time about 34 sq. kilos., and on its extending as far as the fortifications this figure became 44 sq. kilos.; and now having outgrown these, Paris covers 72 sq. kilos. and has a population of over 2,860,000. The contour is very uneven. Taking as datum the Place du Châtelet, the level remains practically the same in the riverside quarters and on the banks of the tributary stream, the Grange-Batelière. It rises, however, at times steeply, in various directions—to 22 m. at the Panthéon, 26 m. at the Place d'Italie, 24 m. at the Trocadéro, 22 m. at the Etoile, 89 m. at the Butte Montmarte; and 92 m. at Belleville. During 100 years the steady increase in the density of the population in the suburbs and communes has obliged the gas-works to increase their mains as fast as extensions of plant permitted.

Between 1817 and 1822 there were constructed five gas-works—at the Hôpital Saint-Louis, Luxembourg, Rues de la Tour d'Auvergne, du Faubourg Poisonnière, and des Ternes. Between 1834 and 1842 various companies built the following works: Grand-Prieuré, Belleville, Ivry, Passy, and Vaugirard. The old Paris Gas Company, into which were emerged the various companies existing in 1856, built La Villette. In 1861, when the limits of the city were extended, the Council entrusted to that Company the new concession; and the Saint-Mandé Works were taken over, and Clichy and Landy built subsequently.

A few years hence, Paris will be supplied with gas by the twin works of Landy-Cornillon, by a projected works in the south-east, and by the two old stations (Clichy and La Villette) now in the course of transformation, which will supply the north of the city.

When taking over the concession in 1907, the Société du Gaz de Paris found themselves faced with an annual demand of 380 million cub.m.; and in spite of the war, the figure reached 545 millions in 1923. They laid a high-pressure girdle main and built a distributing station in the middle of Paris [Place du Châtelet—see an article in the "JOURNAL" for June 18, p. 835] which also supplies the holders at Vaugirard and Saint-Mandé. Nowadays the following quantities of gas are dealt with hourly by the compressors at Landy and La Villette:

From	Landy	to	Clichy,	25,000	cub.m.	through	1000	mm. main.
From	"	"	"	15,000	"	"	700	mm. "
From	"	La Villette,		20,000	"	"	"	" "
From	"	Vaugirard,		15,000	"	"	"	" "
From	"	Saint-Mandé,		12,000	"	"	"	" "
From La Villette to Clichy,				9,000	"	"	"	" "

In 1864, the mean pressure drop between the works and le Châtelet was from 62 mm. to a maximum of 94 mm. In 1907, the number of mains had been practically doubled, and the Ternes and Belleville Works had disappeared; and the pressure drop had decreased to 53 to 63 mm. In 1923, the figures were 25 and 45 mm. respectively.

(*To be concluded.*)

At Leeds Town Hall, on the 6th inst., a tablet erected in memory of Joseph Apsdin, the Leeds stonemason who a century ago invented portland cement, was unveiled. There was a large attendance of delegates from the American Portland Cement Association.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

Institution Education Scheme.

SIR,—There is a sentence in the President's remarks on the annual report of the North British Association of Gas Managers, published in your last issue (p. 805), to which attention may be drawn. In speaking of the education of the junior of the future, the President said: "The first step was, of course, the diploma, but afterwards there would be a degree in gas engineering."

Surely this is an inversion of the true sequence. The degree in gas engineering is a very valuable distinction, implying a sound scientific training combined with some practical experience. The practical work, however, is necessarily restricted. On the other hand, the diploma in gas engineering, according to the standards set up by the present Board of Examiners under the Institution Scheme, implies a scientific training scarcely, if at all, inferior to that of the degree, combined with practical experience extending over some years. This experience, in turn, implies a knowledge of, and a power to grapple with, the problems and emergencies continually arising on a gas-works. I suggest, therefore, that the natural sequence is first the degree and then the diploma.

WALTER HOLE.

"*Dentdale*," *Barton, Torquay, Sept.* 15, 1924.

Price of "National" Benzole Mixture.

SIR,—We are surprised to see in your issue dated the 10th inst., under the heading "Petrol and Benzole," that you have quoted the retail price of "National" benzole mixture as 1s. 7d., instead of 1s. 7½d. a gallon.

This has caused a little inconvenience, and we shall be glad if you will kindly take steps to amend this formally in your next issue.

NATIONAL BENZOLE COMPANY, LTD.
ELWYN O. HUGHES,
Publicity Manager.

Wellington House, Buckingham Gate, London, S.W. 1. *Sept.* 15, 1924.

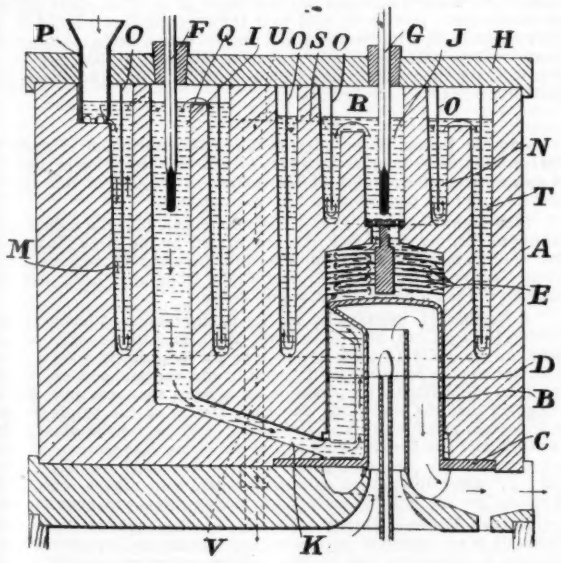
REGISTER OF PATENTS.

Calorimeters.—No. 220,116.

M'ALPINE, G. L., of Catford.

No. 15,948; June 20, 1923.

In calorimeters it is customary to make the water containing and circulating passages of thin metal, which is carefully insulated by cork, flannel, or other bad conductor of heat to prevent escape of heat. Such constructions have certain disadvantages due to the cost of the metal container, its heat conductivity, and the risk of the insulating material becoming wet and losing thereby much of its heat insulating quality. The object of the present invention is to avoid all these disadvantages. It consists in forming the circulating liquid container and passages of sufficiently rigid heat-insulating material impervious to water.



Spot-Test Calorimeter.

The illustration shows a vertical view of a "spot test" calorimeter in accordance with the invention. The liquid containers, heat interchanger container, and liquid passages are constructed in the form of a block A of bad heat-conducting material impervious to water. The heat interchanger B, having a flange C, is inserted in the cylindrical cavity D, within which is also situated the baffle E. Mercurial thermometers F and G are supported from a lid H in the cold and hot liquid containers I and J respectively; and a passageway K connects these two containers. The latter are surrounded by annular cavities M and N, within each of which there rests a shield O having a notched or serrated base permitting the flow of liquid in accordance with the arrows.

The flow of liquid through the block is as follows: Into the inlet tube P, downwards around the outside of the shield O surrounding the chamber I, upwards within this shield, over the weir Q, downwards through the chamber I, through the passageway K, upwards through the liquid passageways in the heat interchanger B, upwards between the baffle plate E, upwards through the chamber J, over the weir R, downwards and then upwards within the cavity N, over the weir S, downwards and then upwards within a further annular chamber T (also containing a cylindrical shield O), and finally over the weir U and out through the discharge passage V. The weirs U and S and the discharge passage V are shown in dotted lines. These parts are so disposed that the liquid is forced to take the longest path from the weir S to the weir U. A suitable material to constitute the block is ebonite, but the best material is "Onazote," which may be described as a sort of foam, made of a hard rubber composition.

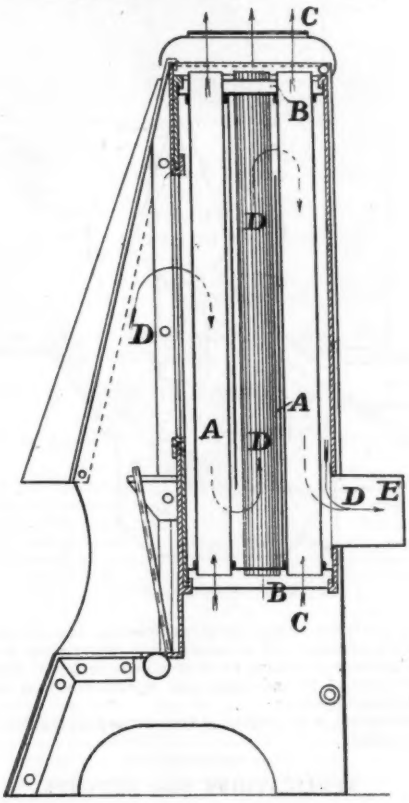
A modification is applicable to a recording calorimeter.

Air-Heating Gas Fires.—No. 200,520.

FAURE, R., and BOURRELLY, G., both of Paris.

No. 17,593; July 6, 1923. Convention date, July 6, 1922.

This invention relates to improvements in air-heating gas-fires of the type in which the hot combustion gases, after rendering incandescent a radiation surface, pass into an air-heating chamber through which open-ended air tubes extend; these tubes being arranged in series separated by baffle plates which compel the gases to travel sinuously about the tubes before being discharged into the chimney.



Air-Heating Gas Fire.

A gas fire according to the present invention is shown in cross-section in the accompanying diagram, from which the general arrangement will be readily understood. The air-heating chamber comprises front, rear, and side walls which are connected together by hooked joints.

The air tubes A, separated by baffle plates, are mounted in upper and lower plates B. These plates close the air-heating chamber at the top and bottom. The arrows C indicate the direction of the air through the tubes, and the arrows D indicate the course of the hot gases before they are discharged into the chimney through the pipe E.

Atmospheric Burners.—No. 220,442.

WEYMAN, J. E., of Newcastle-upon-Tyne.

No. 18,946; July 24, 1923.

The purpose of this invention is to provide an atmospheric burner for burning coke-oven gas, &c., under boilers which will allow of the efficient regulation of the gas at varying loads, and a thorough mixing of the primary air and gas. The construction is such that the lighting-up can be done safely, and the state of combustion in the furnace can always be seen by the attendant. A rectangular form of burner is used: the body, or mixing chamber, having its top end first contracted and then expanded. The furnace end of the burner is extended at a suitable angle for delivering the gas and air mixture to the furnace.

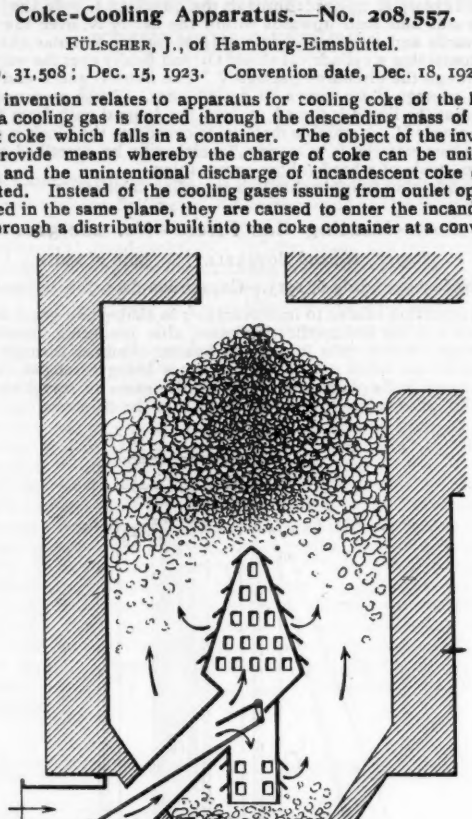
The expanded top end of the burner is fitted with a V-shaped hood having ports with sliding grids. At the apex of the hood a gas box is formed with a short branch pipe for the gas supply. This box is the full width of the burner and extends down into the expanded part of the burner body, tapering towards the bottom end into a narrow slit equal in area to the gas supply inlet. At the mouth of the slit two sliding segments are fitted which so regulate the gas supply that the pressure at the point of issue to the burner is always the same, independently of the quantity of gas passing.

Coke-Cooling Apparatus.—No. 208,557.

FÜLSCHER, J., of Hamburg-Eimsbüttel.

No. 31,508; Dec. 15, 1923. Convention date, Dec. 18, 1922.

This invention relates to apparatus for cooling coke of the kind in which a cooling gas is forced through the descending mass of incandescent coke which falls in a container. The object of the invention is to provide means whereby the charge of coke can be uniformly cooled, and the unintentional discharge of incandescent coke can be prevented. Instead of the cooling gases issuing from outlet openings arranged in the same plane, they are caused to enter the incandescent coke through a distributor built into the coke container at a convenient



Coke-Cooling Apparatus.

position with relation to the discharge opening, and having a series of superimposed openings so arranged that the cooling gases issuing therefrom produce a cooling zone of a definite depth, through which the entire charge of incandescent coke is bound to pass before reaching the discharge opening.

The construction is illustrated in the accompanying drawing, which is self-explanatory.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Sept. 10.]

Nos. 20,459 to 21,112.

ASHMORE, BENSON, PEASE, & CO., LTD.—"Regulating, &c., valves for regenerative gas furnaces." No. 21,038.

CASPARI, F.—"Distillation of bituminous substances." No. 20,704.

HELPS, G.—"Gas-fires." No. 20,644.

HOLDEN, T. F.—"Manufacture of water gas." Nos. 20,824, 20,825.

JONES, F. J.—"Manufacture of combustible gas." No. 21,071.

KEIGHLEY, F. W.—"Detachable liners for gas-engine cylinders." No. 20,850.

PICKLES, H. J.—See Ashmore, Benson, Pease, & Co., Ltd. No. 21,038.

RUTHERFORD, T. A.—See Ashmore, Benson, Pease, & Co., Ltd No. 21,038.

Co. Dublin Lighting Scheme.—The lighting of a new colony area provided by the British authorities for ex-service men at Killester, near Dublin, has been under consideration by the North County Dublin Rural Council, and it has been decided to ask the Free State Local Government Department to take steps for the acquisition of the necessary urban powers. The form of lighting will be the subject of an official inquiry.

MISCELLANEOUS NEWS.

GAS REGULATION ACT APPLICATIONS.

There have appeared in the "London Gazette" the following further notices regarding applications to the Board of Trade under the Gas Regulation Act.

SPECIAL ORDERS.

Great Yarmouth Gas Company.

The Company intend to apply to the Board of Trade for a Special Order to extend the limits of supply so as to include the rural district of East and West Flegg, to enable them to use scheduled land for gas-works purposes, to authorize the payment of interim dividends, and to make provisions regulating the supply of gas.

Maryport Urban District Council.

Application is to be made by the Council for an Order under section 10 to enable them to borrow money, subject to the sanction of the Ministry of Health, for the purposes of their gas undertaking.

DECLARATION OF CALORIFIC VALUE.

Rhymney and Aber Gas Company.—425 B.Th.U. (Dec. 23.)

GAS DIRECTORS RETIRE FROM COUNCILS.

At a meeting of the Penzance Town Council last Wednesday, a question was asked by one of the members regarding the position of Alderman Tonking under the Bailhache decision. Alderman Tonking is Chairman of the Penzance Gas Company, and the Town Clerk held that such a position amounted to a disqualification, even though the Alderman might not vote or take part in any discussion when lighting contracts were under consideration. Alderman Tonking said he had made up his mind to retire from the Council, of which he had been a member for thirty-two years. He added that during the whole of the time he had been a Director of the Gas Company he had never spoken or voted in connection with lighting contracts, and had, in fact, studied the interests of the ratepayers rather than those of the Company. The Mayor and several other members paid tributes to Alderman Tonking's ability and integrity, and a resolution was passed asking him to defer his resignation until the appeal against the Bailhache judgment was decided.

In consequence of the same legal decision, two Directors of the Chertsey Gas Company have tendered their resignations from the Council and Guardians.

Writing to "The Times" on the same subject, "Clerk to County Council" points out that unless Mr. Justice Bailhache's decision is reversed or legislative action is taken, many counties and towns will be deprived of the services of some of the ablest of their local administrators. He goes on: "May I point out we shall be affected in my county, and I presume that all counties are in a somewhat similar position? Our chairman happens to be chairman of a gas company in a small town in the county who supply gas to the schools for which the council pay. The chairmen of several of the committees, and also some of the ablest business men on the council, are directors of local gas and water companies, with whom my council 'contract' for gas, tar, and water. All of these are, I presume, disqualified to act. Surely it was never intended that directors of these public utility companies should be ineligible to serve their county or town merely because the council purchase from them gas and water at the fixed rates payable by the public. It may be said that these councillors should resign their directorships, but this does not prevent action being taken against them for their past delinquencies; moreover, some of them are unwilling to sever their connection with companies which they have seen grow from infancy to huge concerns."

Another Reduction at Leamington.—Announcement is made by the Leamington Priors Gas Company of a further reduction in the price of gas, as from the reading of the meters at the end of the present quarter, from 9d. per therm to 8¾d. per therm.

Nico Light Company, Ltd.—It is announced that the reduction of capital to 10s. per share has been confirmed by the High Court, and that the change of name from the New Inverted Incandescent Gas Lamp Company, Ltd., to the Nico Light Company, Ltd., has also received the sanction of the Board of Trade.

A Member of Parliament on Co-Partnership.—Addressing the Cardiff Rotary Club, Mr. F. Murrell, M.P., said that capital had to make up its mind to take labour into partnership, to treat it as an associate equally concerned with itself in the success and conduct of business, to distribute the proceeds on a basis that was just, and to recognize that the well-being and contentment of the employee was as important as efficiency and dividends. Labour, on the other hand, had to accept partnership with capital on terms that secured for it a fair share in their joint enterprise. There was need for friendliness and trust, determination to co-operate fairly with others, recognition of mutual service, willingness to work, and a spirit of real comradeship.

Saltash Public Lighting.—The ancient borough of Saltash, in Cornwall, is encountering some difficulty in changing its public lighting from gas to electricity, and at one time recently there seemed a prospect of the town having no street lights for some while after the end of this month. At last week's meeting of the Town Council, Mr. J. A. Venn (the Chairman of the Works Committee) said the Secretary of the Gas Company had written declining to enter into any fresh contract for the public lighting of the borough for a less period than agreed with any other lighting company. A deputation had, however, waited upon the electric light contractors, and made temporary arrangements with them for public lighting from the expiration, on Sept. 30, of the present contract with the Gas Company.

EDUCATION PROGRAMMES.

Much information regarding educational facilities has been received during the week. That which is of interest to the readers of the "JOURNAL" has been collated; and from the following it will be seen that these facilities have been greatly extended and improved.

THE HALIFAX GAS COLLEGE.

The Halifax Gas College has been founded to make practicable specialized training in all branches of gas enterprise, and tuition is carried out by correspondence.

The preliminary courses have been defined after due consideration of what is necessary in subsequent work. They are written with the object of giving a boy leaving school a thorough introduction to the industry, and of preparing him for specialization. Having supplied the foundation, general and specialized training is proceeded with, as is instanced by the inclusion of industrial history and economic geography in the scheme for gas supply and gas salesmanship.

In the courses in gas supply the specialized treatment of ancillary subjects makes practicable a more detailed treatment of this subject, and the insistence upon scale drawings in place of the usual rough sketches. The preparatory training for this is introduced in the preliminary course. Industrial history is introduced with the object of preparing a student for a careful study of competitive enterprise.

The retention and development of the lighting load is a problem of steadily growing importance, which requires for its solution a wider and clearer knowledge of illuminating engineering. Hence this phase of gas supply is treated as a distinct subject.

Application has been made for "official recognition" as an "approved school" for the training of students in gas engineering and supply.

The courses in salesmanship present a solution to the problem of the training of gas salesmen, which it is hoped will meet with the approval of the body responsible for the formulation of a scheme of training for those engaged in this branch of gas business. The syllabus of these courses is built upon that of the Institution in gas supply from considerations which have been treated at length in "The Scientific Promotion of Gas Sales."

The course in book-keeping and accounts and the statutory accounts of gas undertakings has been arranged to provide a course of study for clerks and others who cannot now sit for the examinations of the Institution in gas engineering or supply.

The course dealing with financial management and administration of gas undertakings is introductory and complimentary to the treatise by Mr. George Evetts on "The Administration and Finance of Gas Undertakings"; while the course in distribution and sales management has the same relation to Part I. of "The Scientific Promotion of Gas Sales." These constitute an endeavour to bridge the gap between the technical and administrative phases of gas-works management.

The Principal of this new Correspondence School is Mr. Arthur Coe; the Director of Studies is Mr. H. Edford Priestley, M.A.; and the Advisor on Science Studies is Mr. G. Sutcliffe, B.Sc.

COMMERCIAL EDUCATION.

It has been suggested that the Royal Society of Arts should bring the comprehensive scheme of evening instruction in commercial subjects now provided by the London County Council, and also the commercial examinations organized by the Royal Society of Arts, more directly to the attention of heads of large business houses in London, and make an appeal to them to give facilities to their junior employees to attend these evening classes with a view to furthering their education and to their taking recognized examinations at the end of each session. A number of manufacturing and commerial firms in London already make valuable concessions of this nature to their staffs, and it is hoped that their example may be more widely followed.

Education organizers ask that in business houses where a large clerical staff is maintained the employers should urge the younger members of their staffs to continue their education by attending classes at the London County Council Evening Commercial Institutes or at certain of the leading Proprietary Institutions, and that such employees should receive practical encouragement by being granted facilities for leaving in good time on class nights, and possibly by having the amount of their fees refunded by the firm on obtaining certificates at the end of the session.

It is often the case that young people on leaving school are by no means eager to pursue their education further, and it is only after a lapse of years that they realize they have lost valuable time in not taking up the study of various commercial subjects not included in the school curriculum. Advice and encouragement in these matters from a principal or manager in the office does much to correct such slackness in the young clerk, and experience shows that such advice often carries more weight than parental influence. The student will work all the harder if he knows his chief takes an interest in his studies, and principals of schools of commerce are always willing to supply confidential reports of attendance and progress where desired by the firm. Employers can, in this way, do much to raise the efficiency and usefulness of their clerks, and thus benefit themselves and the community at large.

It is, of course, true that much of the work in an office is specialized and peculiar to the firm in question; but it is nevertheless the fact that an employee who, in his spare time, acquires a good knowledge of book-keeping, or shorthand and typewriting, or a modern language, as well as a theoretical knowledge of the principles of commerce, must be far more useful than one who is satisfied to pick up merely the routine work of the office. A clerk who takes an approved course of study and attends classes regularly at a commercial institute, becomes a more valuable and reliable member of the office staff; he improves his memory, gains initiative, and takes a more intelligent interest in his work.

The junior staffs of many commercial houses are now being recruited from the central schools which have been instituted by most local education authorities during the last few years. Many of these schools enter a large number of candidates (aged 14 to 16) for a group of four subjects in the elementary stage of the Society's Examinations. The subjects usually taken are arithmetic, English, book-keeping, and commercial correspondence, and success in these subjects qualifies the student for the Elementary Commercial Knowledge Certificate. Candidates holding this certificate should, on entering business life, be well prepared to undertake a further commercial course leading up to the advanced stage of the Examinations. It may be mentioned here that several large industrial corporations make it a condition that their clerical staff should take the various stages of the Society's Examinations, and the employees are graded according to the class of certificate obtained.

Further information as to the classes may be obtained from the following addresses of institutions providing commercial instruction:

BALHAM.—Balham High Road, Elmfield Road, Tooting, S.W. 17.
BOW AND BROMLEY.—Malmesbury Road, Coborn Road, Bow, E. 3.
BRIXTON.—54-56, Brixton Hill, S.W. 2.
CAMBERWELL.—The "Oliver Goldsmith" School, Peckham Road, S.E. 15.
CATFORD.—Brownhill Road, Rushey Green, Catford, S.E. 6.
CLAPHAM JUNCTION.—Plough Road, St. John's Hill, Clapham Junction, S.W. 11.
CLAPTON.—Northwold Road, Upper Clapton Road, E. 5.
DALSTON.—Queen's Road, Dalston, E. 8.
FINSBURY.—The "Hugh Myddelton" School, St. James' Walk, Clerkenwell, E.C. 1.
FULHAM.—Childerley Street, Fulham Palace Road, S.W. 6.
GREENWICH.—Blackheath Road, Greenwich, S.E. 10.
HAMMERSMITH.—William Street, Hammersmith Road, W. 14.
HAMPSTEAD.—The Haverstock Central School, Hampstead, N.W. 3.
HIGHBURY.—Laycock Street, Islington, N. 1.
HOLLOWAY.—Upper Hornsey Road, Seven Sisters Road, Holloway, N. 7.
KENNINGTON.—Kennington Road, Kennington Park, S.E. 11.
LEWISHAM.—Stillness Road, Brockley Rise, Honor Oak Park, S.E. 23.
MARYLEBONE.—Upper Marylebone Street, Great Portland Street, W. 1.
PADDINGTON.—Essendine Road, Shirland Road, Maida Hill, W. 9.
PECKHAM.—Choumert Road, Rye Lane, Peckham, S.E. 15.
SOUTHWARK.—The Paragon School, Searles Road, New Kent Road, S.E. 1.
STEPNEY.—Myrdle Street, Commercial Road East, E. 1.
WESTMINSTER.—St. George's Row, Ebury Bridge, Buckingham Palace Road, S.W. 1.
WOOLWICH.—Bloomfield Road, Plumstead Common Road, S.E. 18.

Communications to the above Institutions should be addressed to the Principal of the Commercial Institute concerned.

CITY OF LONDON COLLEGE, White Street, Moorfields, E.C. 2.
L.C.C. NORWOOD TECHNICAL INSTITUTE, Knight's Hill, West Norwood, S.E. 27.
REGENT STREET POLYTECHNIC, 309, Regent Street, W. 1.
WANDSWORTH TECHNICAL INSTITUTE, High Street, Wandsworth, S.W. 18.

Communications to these Institutions should be addressed to the respective secretaries.

INDUSTRIAL ADMINISTRATION.—WORKS ORGANIZATION AND MANAGEMENT.

The dissemination and acquisition of knowledge on these vital subjects is a practical contribution to the solution of the industrial problems with which employers and labour representatives are confronted. The Industrial League and Council are rendering a real service in this respect in promoting an important series of lectures on the above subjects at the Regent Street Polytechnic. The full course meets the requirements for the Associate Membership of the Institution of Mechanical Engineers, and a Diploma will be issued to all successful students who reach the required standard in the examination and have made 70 p.ct. attendance during the session. The Industrial League are suggesting to employer members that they should enlist the interest of the members of their staffs in this course by the encouragement of a subsidy towards the fees. The response has been gratifying, and some of the employers have agreed to reimburse these to all their employees who secure the attendance stipulated. Those interested should apply to the Secretary, Industrial League and Council, No. 82, Victoria Street, S.W. 1, for full particulars of this valuable series of lectures for post-graduate students.

THE WESTMINSTER TECHNICAL INSTITUTE.

The courses of instruction for those engaged in the gas industry have been entirely re-arranged so as to meet the modern requirements of technical instruction for all grades of employees.

Provision is made for instruction in (1) Gasfitting Theory and Workshop Practice, (2) Gas Supply, and (3) Gas Engineering, for (*a*) trade students, (*b*) technical or professional students, and (*c*) those from the commercial side who require technical instruction for the more efficient carrying-out of their duties. Trade students are strongly recommended to follow a systematic course of study extending over several years. Group courses in gasfitting involve attendance for three evenings a week throughout the session, but may be modified to meet the case of those unable to attend for more than two evenings. Internal examinations in gasfitting under the control of a Board of Assessors will be held at the end of the first year course, and group course certificates awarded for satisfactory attendance, class work, and examination results. In subsequent years the theoretical and practical examination in gasfitting, arranged by the City and Guilds of London Institute in co-operation with the Institution of Gas Engineers, are available; and it is anticipated that these examinations will be remodelled so that certificates will be awarded only for group course instruction.

Grouped courses of instruction, based on the provisions of the scheme for the education, examination, and certification of those engaged in the technical work of the gas industry, drawn up by the Institution of Gas Engineers in co-operation with the Board of Education, are

available for technical or professional students and those engaged on the commercial side of the industry.

The scheme provides for group course instruction in a number of cognate subjects (such as mathematics, physics, chemistry, or engineering) in addition to the essential subjects of gas engineering or gas supply, and certificates of two grades—ordinary and higher—will be awarded for success in part-time day or evening courses. The course for the ordinary certificate extends over three school years for three evenings a week during each year; study for the first two of these being restricted to cognate subjects, and gas engineering or gas supply being taken with cognate subjects during the third year. For the higher certificate, restricted at present to those engaged in the practice as distinct from the clerical side of gas engineering or gas supply, who possess the ordinary certificate or some equivalent qualification, the course extends over two years for three evenings a week, and comprises both gas engineering or gas supply and cognate subjects of engineering or chemistry.

Full provision is made also for technical students who are not eligible for the award of the Institution certificates, and internal examinations will be held in Grade I. Gas Supply and Gas Engineering at the end of the session; certificates being awarded for attendance, classwork, and examination results in these essential subjects, as well as for successful study of cognate subjects. For the Final Grades the examinations of the City and Guilds of London Institute will still be available.

TRADE NOTES.

Burners and Glassware.

The catalogue of incandescent gas burners, glassware, and other fittings just issued by Lighting Trades, Ltd., of Nos. 51 to 57, Garratt Lane, London, S.W. 18, contains illustrated particulars of a large number of useful and well-made appliances in the departments named. Some attractive shades made of "Silk-Ray" lighting glass, which are entirely original for gas, are made of the finest quality glass, and possess a beautiful matt finish that resembles real silk. They are in various colours to harmonize with practically any decorative scheme.

Alliance and Dublin Consumers' Gas Company.—The report of the Directors for the half-year ended June 30 states that the accounts submitted show a profit on revenue account of £56,600, and, after providing for interest on debenture stock and income-tax, there remains the sum of £45,997, to which must be added £8335 brought from last account, and a credit for interest amounting to £360, making a total of £54,692. Out of this total, the Directors recommend the payment of a dividend at the rate of 6½ p.ct. per annum, less income-tax, on the consolidated ordinary stock of the Company, which will absorb £48,495, and the appropriation of the remainder to the reserve fund.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Sept.* 15.

The market for pitch is quiet, and little business is reported. The price is nominal at 57s. 6d. per ton. There is rather more demand for creosote, and the price is steady at about 6½d. per gallon. Tar spirits and other products remain without change.

Tar Products in the Provinces.

Sept. 15.

The market for pitch appears to be entirely neglected, and there is an almost complete absence of demand from the Continent. Some business has been done at lower figures than have ruled for a considerable time past. Creosote is still quiet; but some business is being done at lower figures. Carbolic acid is quite neglected, and crystals are very dull indeed. Cresylic acid is quiet, and there is little or no demand. Naphthalene is neglected.

The average values for gas-works products during last week were: Gas-works coal tar, 36s. 3d. to 41s. 3d. Pitch, East Coast, 47s. 6d. to 50s. f.o.b. West Coast—Manchester, 43s. 9d. to 45s.; Liverpool, 44s. 9d. to 46s.; Clyde, 46s. to 47s. Benzole 90 p.ct., North, 1s. 2d. to 1s. 3d.; crude 65 p.ct. at 120° C., 9d. to 10d. naked at makers' works; 50-90 p.ct., naked, North, 1s. 2d. to 1s. 3d. Toluole, naked, North, 1s. 2d. to 1s. 3d., nominal. Coal tar crude naphtha in bulk, North, 7d. to 7¼d. Solvent naphtha, naked, North, 1s. to 1s. 1d. Heavy naphtha, North, 1s. to 1s. 1d. Creosote, in bulk, North, liquid, 5d. to 5½d.; salty, 4⅝d. to 5⅛d.; Scotland, 5d. to 5¼d. Heavy oils, in bulk, North, 7d. to 7¼d. Carbolic acid, 60 p.ct., 1s. 7½d. to 1s. 8½d. prompt. Naphthalene, £13 to £15; salts, £5 to £7, bags included. Anthracene, "A" quality, 4d. per minimum 40 p.ct., purely nominal; "B" unsaleable.

Price of Benzole.

Complaint has been made that the price of benzole was not altered in last week's report. Our market correspondent says he is sorry the mistake occurred. He has made the change this week, and (in a private letter) suggests that, in justice to our friends, a note should be put in the "JOURNAL" with his apologies for the omission last week.

Further Price Reduction at Pontypridd.—The Gas Committee of the Pontypridd Urban District Council, on the recommendation of Mr. David Muir (the Engineer and Manager), have decided to reduce the price of gas by 1d. per therm from Oct. 1, with a special discount of 10 p.ct. for public lighting. This makes a reduction of 2d. per therm within the last year. A contribution of £1000 was voted from the Gas Department to the general fund.

Photograph showing complete Purifier Installation with Hovey Crane, Oxide Handling Plant, Roof, &c.

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MANCHESTER.

STOCK MARKET REPORT.

THE gradual return to town of holiday makers brought about a slight improvement in business on the Stock Exchange last week. With the pause in the discussions on Foreign political affairs, there was very little activity in Foreign government securities. French Rentes hardened on the news that the American credit for supporting the franc was to be renewed.

During the close season for new issues a good deal of money has accumulated, and dealers are looking forward to a rapid growth of business shortly. Among Home Government stocks, the 5 p.c. War Loan touched 102, and 3½ p.c. Conversion Loan strengthened to 77 7/16; but 4½ p.c. Conversion Loan receded to 98. Both Indian and Colonial stocks were dull.

Business in the Industrial Market, particularly popular securities such as Tobacco and Artificial Silks, was quite good; Cope Bros. and R. & J. Hill in the former section and Celanese and Courtaulds in the latter being most prominent.

In the Gas Market the feature of the week was the further rise in Continental Union ordinary and preference stocks. The former rose 8 points, and the latter 6 points. Alliance and Dublin 4 p.ct. debenture and Wandsworth "A" both rose 3 points. In last week's report comparison was made of the yields of some of the larger gas companies' stocks. In continuation thereof attention is now drawn to the companies with ordinary capital issues between £300,000 and £1,000,000. Speaking generally, those companies with the larger capital show a smaller yield. The stocks of the British, Cardiff, Southampton, and Croydon companies yield at present prices £5 17s. 1d., £6 1s. 10d., £6 7s. 2d., and £6 9s. 4d. p.ct. per annum respectively. Higher returns on money invested can be obtained on Hastings 5 p.ct. and 3½ p.ct. stocks, Bournemouth 5 p.ct. shares, Derby, and both the Brighton stocks—the latter stocks, realizing £6 15s. 8d. and £6 16s. 6d. p.ct. per annum, are perhaps the more attractive, as the Company are now working under a revised standard price.

Transactions were recorded at the following prices:

On Monday, Alliance and Dublin 66⅛, 66⅜, Bournemouth 6 p.ct. preference 11⅛, Brentford "A" 108½, Continental Union 37⅞, 38, European 8, 8¼, Gas Light and Coke 91, 91⅛, 91⅝, 3½ p.ct. maximum 62½, 63½, 4 p.ct. preference 79½, 79⅝, Hastings and St. Leonards 3½ p.ct. converted 79½, Imperial Continental 165, 165½, Primitiva 6s. 6d., 6s. 9⅜d., 7s., South Metropolitan 98¼, 98½, 98⅜, 3 p.ct. debenture 60⅜, 61, Tottenham "B" 101½. Supplementary prices, Danish 60s.

On Tuesday, Alliance and Dublin 66⅛, 66⅝, Brentford "A" 108½, "B" 108, 108½, British 118⅜, 119¼, Commercial 3½ p.ct. 89½, Continental Union 38, 39, Croydon sliding-scale 102 *ex* div., European 8⅛, Gas Light and Coke 90⅞, 91, 91¼, 91⅛, 3½ p.ct. maximum 63½, 4 p.ct. preference 79½, 3 p.ct. debenture 61, 61⅛, Hastings and St. Leonards 3½ p.ct. converted 79½, Imperial Continental 167, Primitiva 6s. 3d., 6s. 10½d., 7s., South Metropolitan 98, 98½, 99, 3 p.ct. debenture 61, Tottenham "A" 118⅜. Supplementary prices, Kingston-upon-Thames 105, 105½.

On Wednesday, Alliance and Dublin 4 p.ct. debenture 65⅜, Bombay 5½, 5⅝, Bournemouth 4 p.ct. debenture 78½, Brentford "A" 108½, "B" 108, 108¼, 108½, Brighton and Hove "A" 126 *ex* div., Cape Town 4½ p.ct. preference 6 7/16, 6½, 6⅝, Commercial 4 p.ct. 91, Continental Union 40, 40½, European 8½, Gas Light and Coke 91⅛, 91½, 91⅛, 91⅝, 91⅜, Hastings and St. Leonards 5 p.ct. converted 95⅓, South Metropolitan 98¼, 98⅝, 98⅞, 99, 6½ p.ct. debenture 105, South Suburban 5 p.ct. 103 11/16, 104, Tottenham "B" 101 9/16, 101¾, 102, Wandsworth "B" 116½. Supplementary prices, Brighton and Hove 5 p.ct. debenture 97, Eastbourne 3½ p.ct. "B" 100½, 101.

On Thursday, Bournemouth 5 p.ct. 12 9/16, Brentford "B" 108½, Brighton and Hove original 170, 172, Commercial 4 p.ct. 91, Continental Union 40, 42, 44, 45, 45½, 45⅝, 7 p.ct. preference 86, European 8, Gas Light and Coke 91, 91¼ 91⅜, 3½ p.ct. maximum 63½, 4 p.ct. preference 79, Primitiva 6s. 9d., 6s. 11¼d., South Metropolitan 99½, South Suburban 5 p.ct. 103, Wandsworth (Epsom), 119, 119½. Supplementary prices, Cape Town 5 p.ct. mort. debentures 76, 76½, Eastbourne 3½ p.ct. "B" 100¾.

On Friday, Alliance and Dublin 66½, 67, 4 p.ct. debenture 65, Bournemouth 5 p.ct. 12 13/16, British 118½, Cape Town 4½ p.ct. 1st mort. debenture 73½, Continental Union 45½, 45⅞, 46, 7 p.ct. preference 90, Gas Light and Coke 91, 91¾, 3 p.ct. debenture 61, Imperial Continental 166, 166½, 166⅞, Primitiva 7s. 1½d., South Metropolitan 98½, 99½, 100. Supplementary prices, Croydon 7½ p.ct. preference 105.

In the Money Market conditions were comfortable. From 2⅜ p.ct. fresh advances at call were obtainable down to 2 p.ct. Treasury Bills, however, were again allotted at the high rate of £3 15s. 3·27d.

The renewal of the Morgan exchange credit of $100,000,000 to the Bank of France was the chief influence on the exchange market, and French francs closed at 83.35, Belgian francs at 89 40, and Italian lire at 101.85; the value of the dollar-sterling being 4.45 5/16.

The Bank rate is 4 p.ct., to which it was raised from 3 p.ct. on July 5, 1923. Bankers' deposit rates are 2 p.ct. The deposit rates of the discount houses are 2 p.ct. at call and 2¼ p.ct. at notice.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Sept. 12.	Rise + or Fall − on Week.	Transactions Lowest and Highest Prices.
£			%p.a.	%p.a.				
131,978	Stk.	Aug. 14	5	5	Aldershot 5 p.c. max. C.	80—83	..	..
235,492	,,	,,	4	4	Do. 4 p.c. Pref.	68—72	..	..
1,551,868	,,	Apr. 3	5½	6	Alliance & Dublin Ord.	63—68	..	66⅛—67
374,000	,,	July 10	4	4	Do. 4 p.c. Deb.	63—68	+3	65—65½
280,000	5	May 22	8	8	Bombay, Ltd.	5—5½	..	5⅛—5⅜
100,000	10	Aug. 14	8½	8½	Bournemouth 5 p.c.	12—13	..	12 9/16—12 13/16
383,110	10	,,	7	7	Do. B 7 p.c.	11½—12½	..	..
150,000	10	,,	6	6	Do. Pref. 6 p.c.	10½—11½	..	11⅛
50,000	Stk.	June 26	3	3	Do. 3 p.c. Deb.	54—59	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb.	74—79	..	78½
992,045	,,	July 10	6 5/16	6 5/16	Brentford A Con.	107—110	..	108½—108⅝
990,500	,,	,,	6⅜	6⅜	Do. B New	107—110	..	108—108½
76,000	,,	,,	5	5	Do. 5 p.c. Pref.	87—92	..	..
306,690	,,	June 12	4	4	Do. 4 p.c. Deb.	75—80	..	..
131,337	,,	,,	—	6	Do. 6 p.c. Rich. Red. Deb.	100—105	..	..
214,740	,,	Aug. 28	11½	11½	Brighton & Hove Orig.	167—172	..	170—172
244,200	,,	,,	8½	8½	Do. A Ord.	123—126	..	126
1,287,500	,,	July 24	5	5	Bristol 5 p.c. max.	91—92*a*	..	..
855,000	,,	Mar. 20	—	7	British Ord.	117—122	..	118½—119½
100,000	,,	June 26	7	7	Do. 7 p.c. Pref.	118—123	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	72—77	..	..
100,000	10	May 22	6	8	Cape Town, Ltd.	6½—7½	..	..
100,000	10	Apr. 24	4½	4½	Do. 4½ p.c. Pref.	6—7	..	6 7/16—6½
150,000	Stk.	June 26	4½	4½	Do. 4½ p.c. Deb.	7—76	..	73½
626,860	,,	July 24	6	6	Cardiff Con. Ord.	97—100	..	..
237,860	,,	June 26	7½	7½	Do. 7½ p.c. Red. Deb.	103—106	..	..
157,150	,,	Aug. 14	6½	5	Chester 5 p.c. Ord.	86—91*b*	..	..
1,513,280	,,	July 24	6	6	Commercial 4 p.c. Cap.	89—92	..	91
560,000	,,	,,	6	6	Do. 3½ p.c. Cap.	89—92	..	89½
475,000	,,	June 12	3	3	Do. 3 p.c. Deb.	56—59	..	..
800,000	,,	14 Jan. 15	—	—	Continental Union, Ltd.	42—47	+8	37½—46
200,000	,,	June 12	7	7	Do. 7 p.c. Pref.	85—90	+6	86—90
660,000	,,	Aug. 28	6½	6½	Croydon sliding scale	99—102	..	102
284,975	,,	,,	5	5	Do. max. div.	82—86	..	..
492,270	,,	Aug. 28	9	6	Derby Con.	107—110*	..	111
55,000	,,	July 10	4	4	Do. Deb.	74—76*c*	..	..
209,000	,,	Apr. 3	5	5	East Hull 5 p.c. max.	..	..	..
1,002,180	10	July 24	2	6	European, Ltd.	7½—8½	..	8—8½
16,503,045	Stk.	Aug. 14	10	5½	Gas Light & Coke 4 p.c. Ord.	90—92	..	90⅞—91⅛
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	61—64	..	62½—63⅜
4,062,235	,,	,,	4	4	Do. 4 p.c. Con. Pref.	78—81	..	79—79⅛
4,761,930	,,	June 12	3	3	Do. 3 p.c. Con. Deb.	60—63	..	61—61⅛
130,000	,,	,,	10	10	Do. 10 p.c. Bonds	..	..	..
42,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb.	..	..	..
82,500	,,	Sept. 11	6½	6½	Hastings & St. L. 5 p.c. Conv.	95—100*	..	93½
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	75—80*	−1	79½
70,000	10	May 8	10	10	Hongkong & China, Ltd.	16—17	..	..
86,600	Stk.	Aug. 14	10	10	Hornsey 7 p.c.	138—143	..	..
1,976,000	,,	May 22	10	30	Imperial Continental Cap.	165—170	..	165—167
263,950	,,	Aug. 14	3½	3½	Do. 3½ p.c. Red. Deb.	68—72	..	..
235,242	,,	Aug. 14	6½	6½	Lea Bridge 5 p.c. Ord.	91—100	..	..
2,127,340	,,	Aug. 14	5½	5½	Liverpool 5 p.c. Ord.	88½—89½*b*	−½	..
600,000	,,	Mar. 20	7	7	Do. 7 p.c. Red. Pref.	105—108*b*	..	..
165,736	,,	Aug. 28	8	9	Maidstone 5 p.c. Cap.	120—125	..	..
63,480	,,	June 26	3	3	Do. 3 p.c. Deb.	53—58	..	..
75,000	5	,,	5	7	Malta & Mediterranean	3½—3¾	..	..
341,920	Stk.	June 12	4	4	Montevideo, Ltd.	54—59	..	..
1,875,892	,,	July 24	5½	5	Newcastle & Gateshead Con.	81½—82½*d*	−½	..
250,166	,,	,,	4	4	Do. 4 p.c. Pref.	74—75*d*	..	..
529,705	,,	June 26	3½	3½	Do. 3½ p.c. Deb.	70—72*d*	..	..
15,000	10	Aug. 28	11	11	North Middlesex 10 p.c.	15½—16½	..	..
75,940	10	,,	7 7/10	7 7/10	Do. 7 p.c.	11—11½	..	..
300,000	Stk.	May 8	9	7	Oriental, Ltd.	98—101	..	..
138,120	,,	June 26	7⅞	7⅞	Plym'th & Ston'house 5 p.c.	112—117	..	..
60,000	50	Aug. 28	13	13	Portsea Island B	99—102	..	..
100,000	50	,,	12	12	Do. C	95—100	..	..
2,289,909	1	—	—	—	Primitiva Ord.	¼—½	..	6/3—7/1½
341,400	100	June 2	4	4	Do. 4 p.c. Red. Deb.	75—78	..	..
600,000	Stk.	July 24	4	4	Do. 4 p.c. Red. Deb. 1911	53—56	..	..
220,335	,,	June 26	4	4	Do. B. Aires 4 p.c. Rd. Db.	54—57	..	..
321,670	,,	,,	4	4	Do. R'r P'te 4 p.c. Rd. Db.	54—57	..	..
150,000	10	Mar. 20	6	6	San Paulo 6 p.c. Pref.	7—7½	..	..
125,000	50	July 1	5	5	Do. 5 p.c. Red. Deb.	41—43	..	..
270,000	Stk.	Aug. 28	5/8/1/4	5½	Sheffield A	100—102*e*	..	..
419,968	,,	,,	5/8/1/4	5½	Do. B	100—102*e*	..	..
1,047,000	,,	,,	5/8/1/4	5½	Do. C	100—102*e*	..	..
90,000	10	June 12	6	8	South African	7—9	..	..
6,609,895	Stk.	Aug. 14	6½	5	South Met. Ord.	98—100	+1	98—100
102,580	,,	July 10	5	5	Do. Red Pref.	96—102	..	..
1,895,445	,,	,,	3	3	Do. 3 p.c. Deb.	59—62	..	60½—61
734,000	,,	Sept. 11	6½	6½	Do. 6½ p.c. Red. Deb.	101—103*	−2	105
91,500	,,	Aug. 28	8½	8½	South Shields Con.	133—135*d*	..	..
1,087,795	,,	Aug. 14	6½	6½	South Suburban Ord. 5 p.c.	102—105	..	103 104
368,837	,,	June 26	5	5	Do. 5 p.c. Deb.	93—98	..	..
647,740	,,	May 8	6	5	South'mpt'n Ord. 5 p.c. max.	85—88	..	..
121,275	,,	June 26	4	4	Do. 4 p.c. Deb.	74—78	..	..
250,000	,,	Aug. 28	7	7	Swansea 7 p.c. Red. Pref.	101½—103½	..	..
200,000	,,	June 26	6½	6½	Do. 6½ p.c. Red. Deb.	102—104	..	..
120,000	,,	July 24	8	8	Tottenham District A 5 p.c.	116—119	..	118½
582,275	,,	,,	6½	6½	Do. B 3½ p.c.	99—102	..	101½—102
181,255	,,	June 12	4	4	Do. 4 p.c. Deb.	76—80	..	..
258,251	,,	Aug. 28	7/14/4	5	Tynemouth Con. and New	84—86*d*	−2	..
					Wandsworth, Wimbledon, and Epsom—			
30,000	,,	July 10	9½	9½	Wandsworth A 5 p.c.	135—140	+3	..
255,636	,,	,,	7½	7½	Do. B 3½ p.ct.	113—118	..	116½
08,075	,,	,,	6/7/9	6/9/6	Do. C	96—101	..	..
240,865	,,	,,	6/7/9	6/9/6	New Ordinary	..	..	..
35-,000	,,	,,	7½	7½	Wimbledon 5 p.ct.	110—115	..	..
9-,000	,,	,,	7½	7½	Epsom 5 p.ct.	115—120	..	119—119½
88,416	,,	June 26	3	3	3 p.c. Deb.	55—60	..	..

Quotations at:—*a*.—Bristol, *b*.—Liverpool. *c*.—Nottingham. *d*.—Newcastle. *e*.—Sheffield. * Ex. div.

NORTH-EAST COAST COAL TRADE.

From our Own Correspondent.

There is still no improvement to record in the coal trade, and, as far as can be seen, there is no prospect of any break in the depression. Definite orders for early shipment remain as scarce as ever, and, however low the fitters make prices, in order to try to keep the pits at work, there is not nearly enough trade to go round. Most collieries still have a few higher-priced contracts running, which were made at the beginning of they ear for twelve months. With these to average-up their prices, they are able to keep going at any rate part time. What will happen when these expire, it is difficult to tell, as buyers' ideas for next year (when anyone can be found who contemplates buying!) are generally hopeless in relation to present costs of production. And wages are now at the minimum.

Wear Special gas still quote 22s. 6d. to 23s., and best qualities 21s. 6d. to 22s. 6d. Actual prices for prompt or early shipment depend upon collieries' positions, but there should be little difficulty in buying at 21s. Seconds are plentiful, and, though nominally 18s. to 18s. 6d., buyers have a wide choice at 17s. to 18s. f.o.b.

YORKSHIRE AND LANCASHIRE COAL TRADE.

From our Local Correspondent.

Generally it has been a quiet week with the coal trade. In Yorkshire the the industrial demand has been weak, and the export situation remains bad. The colder weather has served to improve to some extent the turnover for house fuels. Blast furnaces continue to close down, and the depression in the iron and steel markets is acute. There has been considerable interference with the working of the pits in the Barnsley area in consequence of Doncaster race week, and the output has been much reduced. At the same time, the demand has been readily met. Forward buyers are asking concessions which collieries decline to make. All classes of industrial fuel are only in quiet request, and washed sorts are slightly cheaper; singles being quoted at 18s. 6d. per ton f.o.b., and doubles at 19s. 6d. to 20s.

Gas coal is steadily increasing in demand with contract deliveries better taken. In the Sheffield area the trade is depressed. A brighter tone is slowly pervading the trade in Lancashire, and more business is passing. This is particularly the case with house coal, and orders from merchants are plentiful. Coke remains depressed, but generally apart from this there is a more optimistic feeling.

The official return just issued of the trade at Hull shows that during August 468,505 tons of coal entered the port from the collieries; 452,142 tons coming by rail, and 16,363 by water. Compared with the entry of 564,317 tons in August last year, the figure shows a decrease of 96,892 tons. The entry of coal for this year to the end of August was 3,316,277 tons, as against 4,715,900 tons during the corresponding period of last year—a decrease of 1,399,623 tons.

The following prices have ruled, but the business done has been little more than negligible: Bunkers: Yorkshire, Derby, and Notts large screened steam, f.o.b. Humber ports, 20s. to 21s. Cargo for export, f.o.b. usual ports: Best Yorks hards, association, 24s. 3d.; Derby best hards, 24s. 9d. to 25s. 6d.; West Yorks Hartleys, 20s. to 24s.; South Yorks washed doubles, 20s.; South Yorks washed singles, 18s. 6d.; dry doubles, 17s.; South Yorks washed smalls, 16s.; Derby slack, 1 in., 13s. 6d.; South Yorks rough slack, 14s. to 14s. 3d.; gas coke, 35s. to 36s. 6d.; foundry furnace coke, 25s. 6d. to 25s. 9d.; washed smithy peas, 22s. 6d. to 27s.; washed steam thirds, 19s. 9d.; and South Yorks washed trebles, 22s.

COAL TRADE IN THE MIDLANDS.

From our Local Correspondent.

There is no expansion of the industrial demand; and the competition for orders in districts which depend largely on the metallurgical trades is increasingly severe. This means some shading of prices, but there is no general decline.

As regards house coal, the position has not altered materially. The September advances, in conjunction with comparatively mild weather, have tended to moderate the inrush of orders. Collieries which produce household qualities in large proportion have booked up their output for some little time ahead, though it is undoubted that merchants have placed orders substantially in excess of their commitments to consumers. Practically all the Cannock Chase and Warwickshire pits are working full time. Outside this radius the pressure is more variable.

The Birmingham and Midland Counties Coal Merchants' Association, in reply to allegations of undue exploitation of the domestic consumer, have published figures showing advances of pithead prices in the Cannock Chase coalfield during July and August at eight collieries described as representative. They ranged from 1s. to 5s. Only one case was shown where the price of a particular quality was not raised. Comparison of present prices with those of a year ago showed advances up to 7s. 6d. It should be pointed out that not a few collieries have made price readjustments to prevent order books becoming further congested and to limit late autumn commitments. The unprofitable prices for much of the coal not saleable for household consumption are also a factor.

Slacks average 9s. 6d. to 10s.; but spot lots have to be sacrificed at substantially lower prices.

The oldest colliery in Warwickshire, the Charity Pit, Bedworth, is being closed, the lessees (Messrs. Stanley Bros., Ltd.) having failed to get sufficient output to cover running expenses. The 800 men who have been employed there will, it is hoped, be taken on at other pits in the coalfield.

The new gas-works at Eastham, which are being constructed by the Corporation of Lytham St. Annes, will be opened on Oct. 23.

During the week end, there were temporary failures of the electric light both at Fulham and Croydon. At the latter place a flaw in a cable led to an interruption just at the busiest shopping hour on Saturday, while in Fulham the failure lasted for ten minutes.

Presenting the report at the annual meeting of the Camelford (Cornwall) Acetylene Gas Company, the Secretary (Mr. A. J. Kellow) stated that the gross profit for the year amounted to £35. The business was increasing, several public buildings and private houses having been linked-up with the Company's supply during the year. The report, which recommended a 5 p.ct. dividend, was adopted.

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(See Article in "JOURNAL," May 21, p. 523.)

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